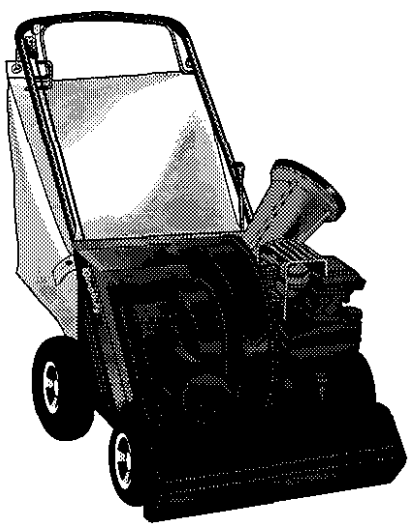
Simplicity

OPERATOR'S MANUAL



Chipper Vacuum

5/25 Series

Mfg. No.	Description
1692371	Model 5/25, 5HP Chipper Vacuum
1692562	Model 5/25, 5HP Chipper Vacuum

8/25 Series

Mfg. No.	Description
1692373	Model 8/25, 8HP Chipper Vacuum
1692564	Model 8/25, 8HP Chipper Vacuum

8/25E Series

Mfg. No.	Description
1692466	Model 8/25E, 8HP Chipper Vacuum, Electric Start
1692566	Model 8/25E, 6HP Chipper Vacuum, Electric Start

1713951-02

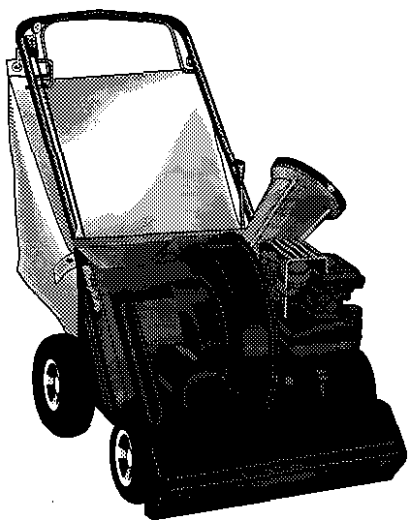
Rev 5/1998
TP 100-2168-02-CV-S

MANUFACTURING, INC.
500 N Spring Street / PO Box 997
Port Washington, WI 53074-0997

www.simplicitymfg.com

Baker
Chipper/Shredder

OPERATOR'S MANUAL



Chipper Vacuum

5/25 Series

Mfg. No.	Description
1692372	Model 5/25, 5HP Chipper Vacuum
1692583	Model 5/25, 5HP Chipper Vacuum

8/25 Series

Mfg. No.	Description
1692374	Model 8/25, 8HP Chipper Vacuum
1692585	Model 8/25, 8HP Chipper Vacuum

8/25E Series

Mfg. No.	Description
1692467	Model 8/25E, 8HP Chipper Vacuum, Electric Start
1692587	Model 8/25E, 8HP Chipper Vacuum, Electric Start

1713952-02

Rev 5/1998
TP 100-2168-02-CV-B

Baker

500 N. Spring Street \ P.O. Box 997
Port Washington, WI 53074.0997 USA

Table of Contents

A DANGER

You must read, understand and comply with all safety and operating instructions in this manual before attempting to set-up and operate your Chipper Vacuum

Failure to comply with all safety and operating instructions can result in loss of machine control, serious personal injury to you and /or bystanders. and risk equipment and property damage. The triangle in the text signifies important cautions or warnings which must be followed.

⚠ WARNING

Engine exhaust from this product contains chemicals known, in certain quantities, to cause cancer, birth defects, or other reproductive harm.

NOTICE

Upon start-up and shut down, you may hear the metal-to-metal sound of the triangular hammers positioning themselves on the rotor. *This is a normal sound.*

If this sound continues after the machine obtains full speed, please contact your dealer for an inspection of your unit.

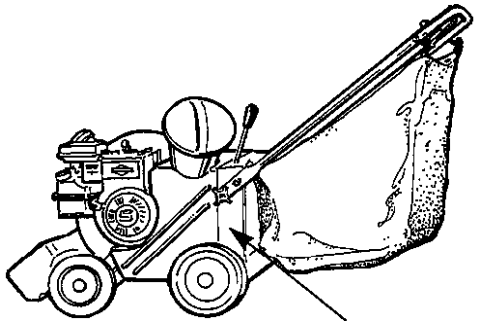
TP 100-2168-02-CV-SB

Introduction

MODEL IDENTIFICATION

- Record your model number, manufacturer number and serial numberfrom the I.D. tag in the space provided t for easy reference. The Chipper Vacuum I.D. tag is located on the side of the unit as shown in the illustration below.
- Refer to the engine manufacturer's owner's manual for the location of the engine serial number.
- Be sure to fill out and return the Warranty Registration Card supplied with your unit.

Model	Mfg. No.	
5/25	**1692371**	**1692582**
	1692372	1692583
8/25	1692373	1692584
	1692374	1692585
8/25E	1692466	1692586
	1692467	1692587



Identification Tag Location

MODEL REFERENCE

Model Number:

Manufacturer Number:

Engine I.D. Number:

Dealer Name

Date Purchased:

DESCRIPTION

General

The shredding chamber is designed to shred materials that have been vacuumed directly into the unit through the extra-wide vacuum intake nozzle or through the flexible vacuum hose, eliminating the need to manually load or feed material into the shredder.

Selective vacuum-shredding can be performed with the optional 20 foot long, large-diameter, quick-connect hose while the unit is stationary, permitting precisely-controlled vacuuming of areas such as flower or shrub beds, or other confined or landscaped areas.

Large yard, garden, or other open, flat surface areas can be cleaned up quickly and efficiently using the Chipper Vacuum's self-propelled feature, which permits vacuuming of materials while the unit propels itself.

Shredding Action

Material is drawn into the shredding chamber by the vacuum action of the spinning rotor, and is pulled into the path of patented shredding hammers that are rotating at the same high speed as the rotor. The hammers cut and grind the material into progressively smaller pieces, and the flow of air then conveys the fully shredded,reduced waste into the discharge bag.

Vacuum Action

In addition to the shredding hammers and chipping knives, the rotor has fan blades integrated into its design. When the rotor is spinning, a constant, powerful vacuum action is created, which aggressively pulls waste into the shredder chamber for shredding.

These spinning fan blades also create a blowing force that ejects the shredded or chipped material out of the discharge chute and into the discharge bag, making room for more material to be pulled in and processed.

Vacuum/Shredding

- Vacuum/Shredding can be performed in confined areas using the vacuum hose attachment, or on large, flat areas using the 3-speed power drive and extra-wide vacuum intake nozzle.
- Areas containing rocks, gravel, or other hard materials should be avoided, as these types of materials will damage the shredding hammers or reduce their service life. Use of the unit to vacuum non-organic materials will void the product warranty.
- Areas to be vacuumed should be inspected for rocks, gravel, and other debris before use. All materials and other debris that could damage the shredding hammers should be removed and properly disposed of before starting the unit.
- Se particularly watchful for small, sharp objects such as old nails, pieces of glass, and small metal objects such as cans, can lids, bottle tops, etc.
- Review all operating safety instructions in this manual before proceeding.
- Determine where the discharge bag will be emptied, and if possible, plan a vacuum path that will allow you to access this area easily while vacuuming.

Chipper Operation

The chipper is designed to handle tree limbs and branches up to 2-1/2" in diameter on 5 HP models, and up to 3" diameter on 8 HP models. The unit can also process tough organic matter such as corn stalks and berry canes.

Chipping operations should be performed while the unit is stationary, and positioned so that the operator has firm footing and easy access to the chipper cone area.

Tree limbs and branches should be inserted "butt end" first into the chipper cone, and are fed into the chipper block. The sharp cutting edges and angle of the blades actually pull the tree limbs and branches into the chipper block, cutting the material into small chips.

The chips of material then pass through a slot in the rotor behind the chipper knives, where air flow conveys them through the fan chamber and into the discharge bag.

Blower Operation

The vacuum force makes it possible to use the unit as a large-area, self-driven blower for clean-up of grass clippings or other debris that you may not want to collect for disposal or recycling.

Using the Chipper Vacuum in this mode requires the removal of the discharge bag, and the attachment of the optional deflector elbow. The deflector elbow is needed to direct the powerful exhaust stream to either side of the unit.

When used in this manner, the operator walks behind the unit, allowing the discharge deflector elbow to blow the lightweight debris toward an area where it can be easily gathered later for disposal, or, as in the case of grass clippings or other organic matter, be allowed to decompose naturally as an added nutrient for the soil.

Safety Rules

The Safety Alert symbol shown to the left is used to alert you to important safety information that must be read, fully understood, and followed at all times when handling, transporting, operating, servicing, or storing your Chipper Vacuum. Each safety alert symbol is followed by a "signal word" that advises you of the relative intensity, or level, of the hazard the safety alert instructions pertain to. The following list of signal words is being provided to help you understand the hazard levels associated with each signal word used in this manual.

⚠ DANGER

The signal word "DANGER" is used when a serious injury or fatality will result if the safety instructions that follow this signal word are not obeyed.

⚠ WARNING

The signal word "WARNING" is used when a serious injury or fatality could result if the safety instructions that follow this signal word are not obeyed.

⚠ CAUTION

The signal word "CAUTION" is used when personal injury, or property or equipment damage could result if the safety instructions that follow this signal word are not obeyed.

⚠ DANGER

You must read and understand this manual and all safety instructions and labeling completely, before attempting to assemble, set-up, transport, operate, service, or install any options or accessories on this unit.

This Chipper Vacuum is a powerful machine designed for chipping of tree limbs and branches up to 2 1/2" in diameter (3" on 8 HP models), and is capable of amputating or causing serious injury to fingers, hands, feet, and other extremities if accidental contact with rotating chipper or shredder blades should occur.

Always keep hands, feet, and other extremities out of the chipper cone and vacuum intake areas, and never wear loose fitting clothing or jewelry that could get caught on tree limbs or branches, and pull your hands, or other body parts into the rotating chipper blades.

GENERAL

Safe operation of the Chipper Vacuum requires that all operating and safety instructions be obeyed by everyone who uses, services, or otherwise handles the unit.

Although the instructions and warnings appearing in this manual cover most normal operating conditions, everyone using the Chipper Vacuum must also always follow safe work practices while operating, servicing, *or* handling the Chipper Vacuum unit under any conditions not specifically covered in this manual.

The primary operator of the Chipper Vacuum must always be alert for the presence of bystanders, who are likely to be unaware of the operating and safety requirements necessary for safe operation. It is the operator's responsibility to prevent bystanders from being exposed to potential hazards whenever the Chipper Vacuum is being used.

If you do not understand any portion of these safety instructions, or any other part of the instructions in this manual, contact your local factory-authorized dealer for help, or request factory assistance by calling: **Customer Service Department - 414/284-8786**

NOTE: DO NOT use the Chipper Vacuum unless you are sure that you know how to comply with all safety and operating instructions.

BEFORE START-UP

- Inspect the chipper cone for any debris, or other material that may have fallen in during unpacking and assembly. Always disconnect the spark plug wire trom the spark plug before attempting *to* remove any objects from the chipper cone.
- Never fill the fuel tank indoors! Gasoline vapors are explosive, and can easily travel unnoticed to sources of ignition, such as pilot lights or open flames on water heaters, furnaces, stoves, dryers or sparks from electric motors and other electrical appliances, or smoking materials. Contact with these or any other ignition sources will cause an explosion or fire, serious personal injury, and damage to property and equipment.
- Gas cap shall never be removed or fuel added with the engine running.
- Never overfill the fuel tank. Fuel may run out of the tank and contact hot engine surfaces and ignite, causing a fire and/or risk of an explosion. Always fill the fuel tank to 1/2" below bottom of filler neck only.
- Use only an approved container for fuel, and always handle the container with extreme care. Never smoke while fueling or transporting the fuel container.

- Never store the fuel container or Chipper Vacuum indoors where there is a possibility of contact with any ignition source such as a spark, open flame, pilot light, heating element, or smoking materials.
- Never attempt to test or operate the unit indoors or in an enclosed area. Engine exhaust contains carbon monoxide, an odorless, colorless, and tasteless gas. If inhaled, carbon monoxide can cause dizziness or nausea, and if prolonged contact occurs, unconsciousness, brain damage, or death can result.
- Check all parts to ensure that they are properly attached and that all hardware is secure.
- Make sure the discharge bag is securely attached to the discharge chute and is properly supported by the bag supports on the bottom of the handle, and the sides of the rear frame.
- Make sure you have read and understand the engine manual accompanying the Chipper Vacuum, and know the location and function of all operating controls for your model Chipper Vacuum. You must understand how to start and stop the unit safely before proceeding.

OPERATING LOCATION

- Always operate the Chipper Vacuum outdoors only, on a firm, level, earthen or grassy area where the unit will be stable and will stay in position. Never attempt to operate the unit on a slope greater than 20 degrees, or on wet or slippery surfaces where you or someone else could slip and fall toward the chipper cone opening.
- Never operate the unit on rocky, gravel, or stone-covered surfaces, as this material could be sucked in to the shredder housing through the vacuum intake openings and cause damage to the shredder.
- This equipment shall not be operated in the vicinity of bystanders. Never operate the unit where children, pets, or others who may be unaware of the potential hazards associated with chipping, shredding, or vacuuming operations could enter the area unexpectedly and be exposed to these hazards.
- Never use the optional hose kit to vacuum up rocky, gravel, or stone-covered surfaces,, as this material will cause damage to the shredderand other internal components.
- Never operate in an area where sparks from the muffler could ignite surrounding dry brush or other flammable materials. See following Fire Hazard Warning!
- Wear hearing protection when the Chipper Vacuum is to be used for prolonged periods of time, or whenever noise reaches an uncomfortable level.

⚠ CAUTION

SPARK/FIRE HAZARD
GAS ENGINES MAY REQUIRE A SPARK ARRESTER FOR SAFE OPERATION

If the engine on this unit is not equipped with a spark arrester and is to be used on any forest, brush, or grass-covered unimproved land, a spark arrester must be added to the muffler before using the engine on such land. The arrester must be maintained in effective working order by the operator. In the State of California, the above is required by law (Section 4442 of the California Public Resources Code.) Other states may have similar laws. Federal laws apply on federal lands. See your authorized engine service center for muffler spark arrester options.

SAFE WEARING APPAREL

- Always wear safety goggles to protect your eyes from flying debris when operating the Chipper Vacuum. One pair of safety goggles has been provided with the unit for your immediate use. All others in and around the immediate area must also wear approved safety glasses to protect their eyes from flying debris.
- Always wear properly-fitted leather work gloves to protect your hands from cuts and scratches caused by tree limbs and branches. Never wear gloves with pull-ties or straps, as these straps could get entangled with branches and draw your hands into the chipper cone cutting areas.
- Never wear loose-fitting clothing, hanging jewelry, ties, scarves, or other items that could get caught on tree limbs or branches, and draw body parts into the cutting areas of the chipper cone.
- Always tie up long hair and prevent it from hanging down, where it could become tangled in branches or get caught in rotating parts and pull you into the cutting areas.
- Even if you are wearing heavy-duty leather work gloves, never, ever place your hands in the chipper cone while the unit is running. If you must reach in to clear a jam or free up branches, shut the unit off, allow the rotor to come to a complete stop, disconnect the spark plug wire at the spark plug, and carefully remove or clear the jammed material.

OPERATING SAFETY

- Always obey the size limitations for tree limbs and branches stated in the Waste Materials Guide section of this manual.

Safety Rules

- Never leave the machine running unattended. Always turn off the engine, wait for the rotor to come to a complete stop, and disconnect the spark plug before leaving the area. Always move the unit to a safe storage area for prolonged idle periods.
- Never allow children to operate the machine. Do not allow adults to operate it without proper instruction.
- Always maintain secure footing and solid balance while starting or operating the Chipper Vacuum. Never lean directly over the machine.
- Select a speed suitable for operating conditions, and stay clear‘of hazards such as large bushes, trees, fences and anything else that could become caught on or entangled with any part of the unit. Sudden contact with these obstacles could cause a momentary loss of control of the unit, or cause you to lose your balance and fall.
- Although the engine is powerful, never attach any kind of cart or riding attachment to your Chipper Vacuum. This is a walk-behind unit only, which will provide years of reliable service when used properly.
- Always stand to one side of the chipper cone when feeding tree limbs and branches. They may occasionally whip around forcefully or “kickback” while being chipped.
- Always keep hands out of the chipper cone when feeding materials. Never wrap fingers tightly around branches as you are feeding them into the unit, as a sudden inward surge could pull your hands and arms into the unit.

* If you are not using the discharge bag to collect chipped debris, always direct the debris flow away from yourself and others, and always stay clear of the discharge area to avoid being struck by ricochets or material being ejected from the machine.

- Never force material as it is being fed into the machine, as this may result in a sudden kickback of the material with sufficient force to injure you or other bystanders.
- Never allow material to build up around the engine during Chipper Vacuum operation. This could result in a fire, or overheating of the engine.
- When using the Chipper Vacuum as a walk-behind, large-area blower, always make sure the area to be cleared of debris is free of gravel, stones, and other hard debris that could be propelled with great force by the powerful blowing action possible with this unit.
- Never continue to operate the machine if it starts making unusual noise or vibration. Shut the engine off immediately, allow the rotor to stop, disconnect the spark plug wire from the spark plug, and do the following:
  a. Inspect the unit for any signs of damage or foreign material in the chipping or shredding areas. Remove any solid material that may be preventing the unit from operating properly.
  b. Check for loose parts, and loose or missing hardware, and repair or replace as reauired.
  c. Check the oil level in the engine crankcase. See the engine manual for the specific location of the oil dipstick, the correct checking procedure. and the type of oil to add if the oil level is low.
- Never attempt to clear clogs from the chipper cone or discharge area while the unit is running. Always shut the engine off, allow the motor to come to a complete stop, and remove the spark plug wire from the spark plug before removing excess materials,
- Never fill the fuel tank while the machine is running or while the engine is hot. An unexpected spillover of fuel could contact a hot surface and ignite, causing fire or explosion. Turn off the engine, and allow the engine to cool before attempting refilling.
- Never attempt to perform any maintenance, repairs, or attachment of accessories while the unit is running. Always shut the unit off, allow the engine to come to a complete stop, and remove the spark plug wire from the spark plug before beginning these. activities. See engine manufacturer’s owner’s manual for any exceptions.
- Never remove covers, deflectors, or warning labels from the unit. If any of these are found to be missing, take the unit out of service until the appropriate repairs can be made. Tag the machine so others do not mistakenly attempt to use it while awaiting parts or repairs.
- Always make sure that the chipper cone area is empty before restarting the unit after it has been idle. Attempting to start the unit with material in this area could cause the engine starting cord to jerk or stop suddenly, causing a risk of injury to your hand or arm.
- Never tamper with any engine controls to alter or increase maximum unit running speed. An overspeeding condition could cause the engine to overheat, resulting in risk of fire, permanent engine damage, and voiding of your product warranty.
- Always comply with the engine manual instructions for operating and periodic maintenance requirements. Make sure the oil level is always in the safe zone, and keep the air filter element clean.
- Never attempt to defeat, bypass, or disable Chipper Vacuum safety features. Making alterations to this

equipment can result in serious injury, damage to equipment, and voiding of your warranty.

TRANSPORTING AND STORAGE

- If you must travel across rock, gravel, or other debris-covered terrain, set the engine speed control to Wow", and close the variable suction control flap by moving the selector lever to the "closed" position.
- Never lift the unit using the fuel tank, vacuum intake areas, or covers for support. If the unit must be lifted for vehicular transportation, always use at least two people, and always grip the unit securely using the units rigid steel frame. The power drive feature should only be used for loading by experienced operators using ramps designed to ensure that the unit stays properly positioned on the ramps while the Chipper Vacuum is moving.
- If the unit must remain tilted for transportation, consult the engine manual for required preparation, Normally, engine fuel and oil must be drained to prevent dangerous fuel leakage, and unwanted transfer of the sump oil into the cylinder head area.
- Always refill the oil sump with the recommended oil before attempting to use the unit again after it has been drained for transportation.
- Always observe safe refueling and fuel handling practices when refueling the unit after transportation or storage.
- Always follow the engine manual instructions for storage preparations before storing the unit for prolonged periods.
- Always follow the engine manual instructions for proper pre-use start-up procedures when returning the unit to service.

SERVICE AND MAINTENANCE

- Always follow recommended engine and Chipper Vacuum procedures when performing required service and maintenance on the unit.
- Use only factory-authorized replacement parts for repair along with recommended factory specifications on all settings and adjustments.
- Never attempt to make major repairs on this unit unless you have been properly trained and certified to work on high-capacity gasoline powered Chipper/ Shredder or Chipper Vacuum units. Improper service procedures can result in hazardous operation, equipment damage, and voiding of the product warranty.

SAFETY DECALS

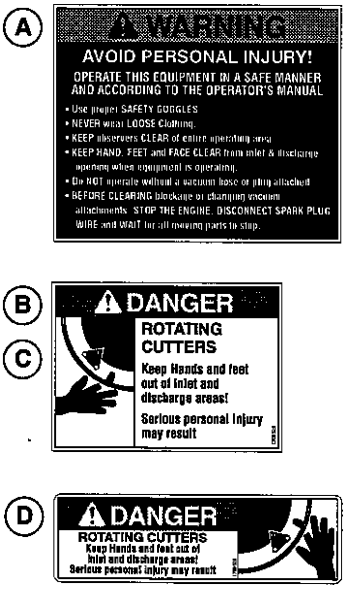
Important safety labels are shown in the following illustration. Please review these labels and if you have any questions regarding their meaning or how to comply with the instructions, re-read the complete safety instruction text on the preceding pages, or contact your local dealer or factory Customer Service Department. Use the pan number information provided to order a replacement label from your local factory-authorized dealer.

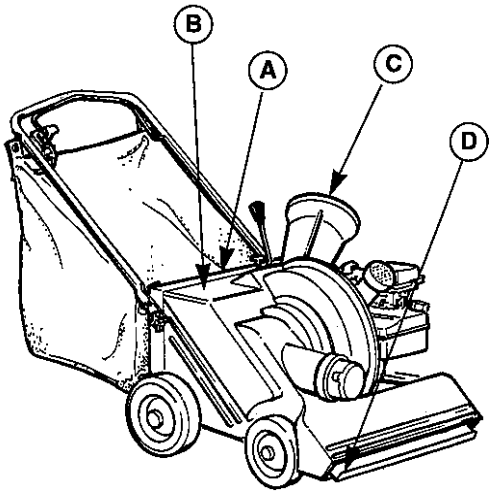
A. Operator Instruction Label
Part No. 1713665

B. Discharge Chute Danger Label
Part No. 5001612

C. Chipper Cone Danger Label
Pad No. 5001612

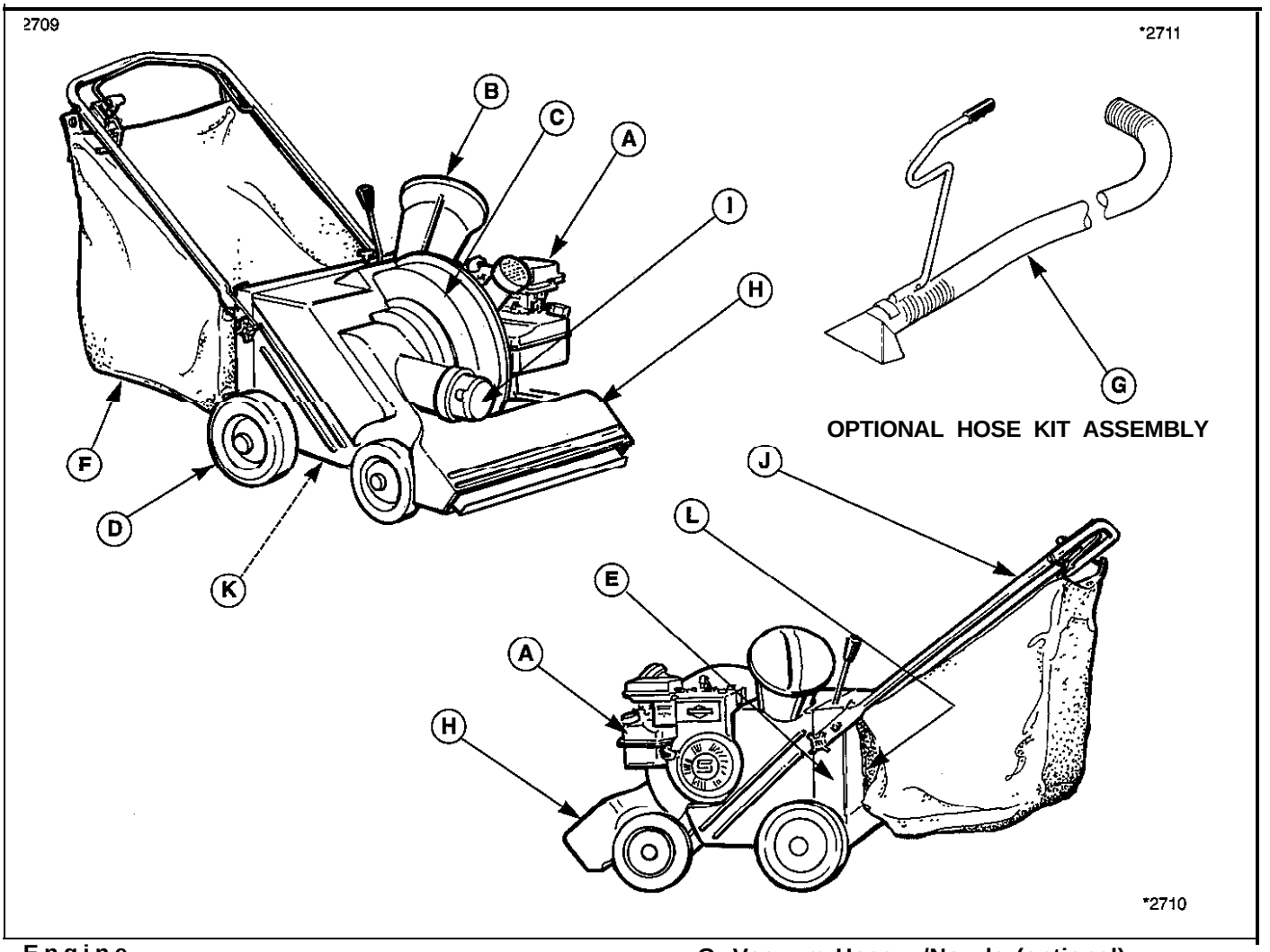
D. Vacuum Hose & Nozzle Intake **Danger Label**
Part No. 1709529





Safety Decal Locations

MAJOR COMPONENTS



Engine
. Chipper Cone/Chipper Knives
. Shredding Chamber
. Drive Wheels
E. Frame
F. Discharge Bag
G. Vacuum Hose w/Nozzle (optional)
H. Vacuum Nozzle w/Variable Suction Control
I. Vacuum Hose Intake
J. Handle Assembly
K. Transmission (not shown)
L. Discharge Tube.

CONTROLS

A. Choke

The choke controls the fuel to air ratio, and helps make cold starts easier by providing a rich, easily-ignited fuel mixture.

B. Throttle

The throttle controls engine speed, and allows you to conserve fuel by powering down during idle periods, or to achieve optimal chipping/shredding/vacuuming power by running the engine at full speed.

C. Vacuum Nozzle Variable Suction Control™

The vacuum nozzle Variable Suction Control™ is directly above and behind the vacuum nozzle, and has four quick-set opening settings for variable nozzle suction control:

- closed (for vacuuming with the optional hose attachment)
- 1/3 open,
- 213 open
- full open.

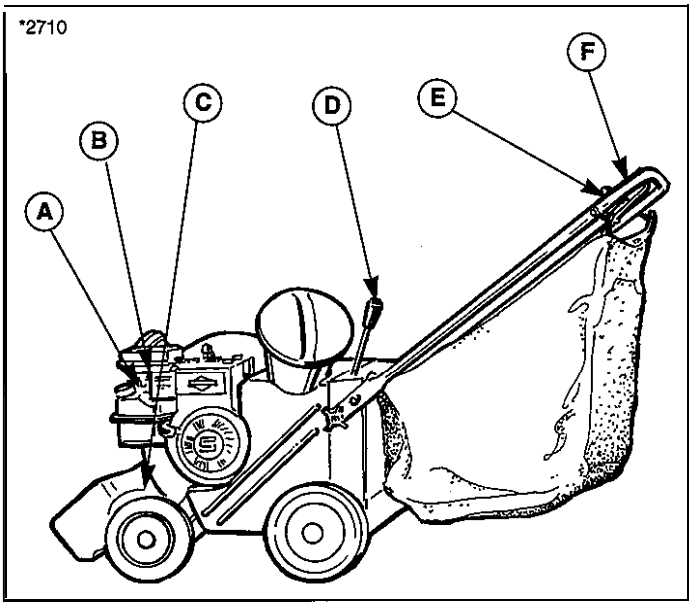
Smaller nozzle openings provide the necessary vacuum force for smaller debris, while a larger opening provides the suction necessary for larger debris like large leaves.

D. Vacuum Nozzle Height Control

The vacuum nozzle height control lever is located at the rear frame in front of the discharge bag. Three height settings are available: Low, Medium, and High.

The low setting is suitable for smooth, hard surfaces, while the medium and high settings are used for different terrain conditions. Settings are easily changed by simply positioning the control lever into one of three different slots.

The height adjustment control may be fine-tuned by means of an rod adjustment that permits precise position control for vacuuming of smooth surfaces. See the adjustment procedure in the TROUBLESHOOTING & REPAIR section.



Operating Controls Locations (5 HP model shown)

E. Drive Speed Control

The Chipper Vacuum is self-propelled, and features three forward speeds to help match vacuuming action to surface conditions The drive speed control lever is mounted on the handle within easy reach of the operator, permitting quick changes in travel speed. This feature allows you to rapidly adjust to changing conditions.

F. Power Drive Bail Lever

The power drive bail lever operates the clutch, the mechanism that transfers power from the drive shaft to the transmission.

Pulling the bail lever down against the Chipper Vacuum handle engages the transmission, which drives the unit forward for vacuum/shredding or moving the unit around your yard and garden.

Releasing the lever disengages the transmission, stopping the power drive motion, and allowing the unit to come to a stop to make adjustments, empty the bag, or perform chipping or hose vacuuming operations.

Operation

SITE LOCATION

1. Select an area that will provide stable footing for both the Chipper Vacuum and the operator. Do not operate on wet, slippery surfaces, or in areas with heavy pedestrian traffic that may distract you from alert operation of the unit.
2. Locate the Chipper Vacuum near the waste materials to be chipped to reduce unnecessary lifting and carrying.
3. Trim and stack the materials to be chipped for more efficient and safe operation of the Chipper Vacuum.
4. Provide sufficient room for maneuvering around the Chipper Vacuum. Never set up the work area so that operators must over-reach or have to step over materials to be processed.
5. Review all operating safety instructions before proceeding.
6. Determine whether you wish to use the discharge bag to collect the chipped material, or the discharge deflector elbow to direct the chipper discharge to a safe area.
7. The optional discharge deflector elbow should only be used when the unit is positioned over a soft surface such as soft dirt or grass, and should always be directed to the side and away from the operator.
8. If the discharge bag is to be used, be sure to allow adequate access around the Chipper Vacuum for bag removal and reattachment.

⚠ DANGER

Internal combustion engines produce Carbon Monoxide, a colorless, odorless, and tasteless gas that can cause dizziness, nausea, unconsciousness, and even brain damage or death if breathed.

Operate the Chipper Vacuum outdoors in a well ventilated location only.

Keep children, pets, and bystanders away from the operating and discharge areas.

Failure to follow these instructions may result in serious injury or death to you or bystanders.

CHECKS BEFORE STARTING

1. Inspect the chipper cone for debris and other objects that may have fallen into the machine while the unit was idle, and remove them before starting the unit. Before reaching into the chipper cone, always disconnect the spark plug wire first to prevent accidental starting of the unit.
2. Inspect the chipper cone and make sure that it is firmly attached to the shredder housing.
3. Check all parts to ensure that they are properly attached and that all fasteners are properly tightened.
4. If a discharge bag is not going to be used to accumulate waste material, make sure the discharge deflector elbow is directed away from the operator, and that the area selected for accumulation of chipped or shredded material will not cause ejected material to be deflected toward the operator or bystanders.
5. If a discharge bag is being used, make sure it is attached to the discharge chute securely, and is correctly supported by using all four support straps.
6. Open the Variable Suction Control™ intake flap on the nozzle, and check to make sure no unwanted debris or other objects are stuck in the nozzle.
7. Fill the fuel tank to a level no closer than 1/2" from the bottom of the filler neck. Obey all safety precautions while handling and fueling the unit. Use regular, unleaded gas only.
8. Check oil level if unit has not been operated since initial set-up.
9. Before attempting to start the unit, make sure:
   - fuel cap is attached securely,
   - oil dipstick is fully inserted in dipstick port,
   - chipper cone cap is installed over chipper cone opening if chipping is not to be performed,
   - speed control lever is in normal, disengaged position, and speed control selector is in position #1.
10. To use self-powered vacuum/shredding mode vacuum hose intake opening plug must be **fully inserted** into intake opening.
11. To use 20' flexible hose for vacuuming:
    - hose end must be **fully inserted** in hose intake opening.
    - Variable Suction Control™ setting is set to closed position.
    - area to be vacuumed is clear of rocks, gravel, other hard or sharp debris, and small animals and pets.

START-UP

The controls required to start the Chipper Vacuum are located on the engine, and are marked “Choke” and “Throttle” (Figure 1). A more detailed description of engine operation and all related precautions and procedures can be found in the engine manufacturer’s manual supplied with each Chipper Vacuum.

Starting The Engine - Manual Start Units

1. Move choke lever to full choke position.
2. Move throttle lever to “fast”.
3. Place foot on front wheel to hold unit firmly in place, and adopt a stable stance.
4. Pull starting rope out slowly one time and allow to return normally.
5. Pull starting rope out with a steady pull, and allow rope to return normally.
6. When engine starts, gradually move choke lever to “no choke” position.
7. Maintain throttle speed at ‘fast” for best performance.

Starting The Engine - Electric Start Units

1. Move choke lever to full choke position.
2. Move throttle lever to “fast”.
3. Turn key to “start” position
4. Release key when engine starts, allowing key to return to “on’ position.
5. When engine starts, gradually move choke lever to “no choke” position.
6. Maintain throttle speed at ‘fast” for best performance.

Idle Speed

Use the “idle” position on the throttle lever to reduce stress on the engine when chipping or vacuum/shredding is not being performed. Lowering the engine speed to “idle” will help extend engine life, as well as conserve fuel and reduce the noise level of the equipment.

WALK BEHIND VACUUM/SHREDDING

Normal operator position for power-drive, walk-behind vacuum/shredding is directly behind the unit holding the units handle securely with two hands. This position provides the best combination of unit control, forward and side visibility, and overall operator safety (Figure 2).

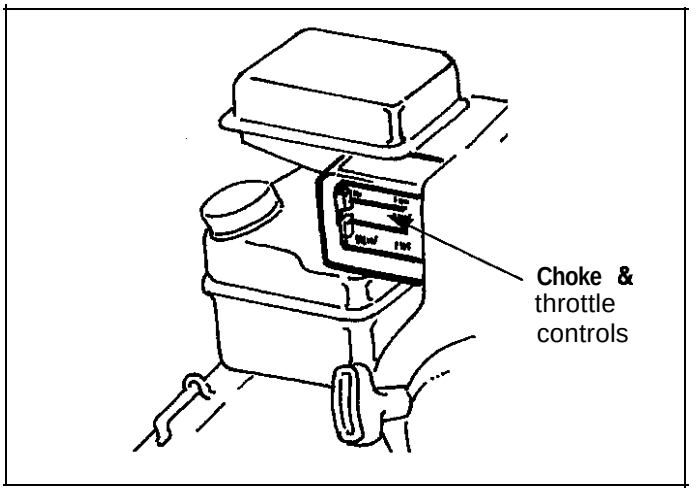


Figure 1. Typical Choke And Throttle Controls

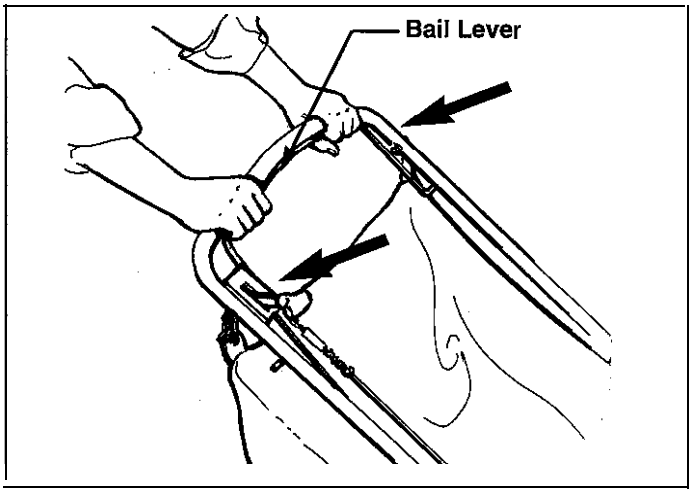


Figure 2. Pull Bail Lever Down And Grip Against Handle To Engage Transmission

The powered wheel drive is engaged by pulling the full-width bail lever down where it can be comfortably gripped against the chipper vacuum handle. Releasing the bail stops the forward movement and disengages the transmission, making it easier to turn or maneuver the unit.

Drive Speed Selector

Forward speed is selected using the speed control lever mounted on the right side of the handle. The speed control lever has three positions: slow, medium or fast (Figure 3).

The ability to select different speeds for differing types of waste material pick-up and varying surface conditions helps give you precise control over the unit, which is further enhanced by the 3-position vacuum height adjustment and 4-position vacuum intake opening adjustment. (These adjustment features will be covered later.)

SLOW SPEED - POSITION #1

Slow drive speed is selected when the lever is pulled all the way back toward the operator into position number one (Figure 3).

Slow speed is recommended for initial use to help the operator get accustomed to the driving characteristics of the unit, and to move the unit very short distances, or for using the flexible vacuum hose.

Slow speed is also recommended for vacuum/shredding of wet leaves on heavy density ground cover such as long, wet grass or thick weeds, or wherever heavier materials or rougher ground covering requires concentrated vacuuming action.

MEDIUM SPEED - POSITION #2

Medium drive speed is selected by moving the lever to position #2 (Figure 3).

Medium speed is used when vacuuming leaves that may be moist, or clinging to medium length ground cover.

FAST SPEED - POSITION #3

Fast drive speed is selected by moving the speed selector lever to position #3 (Figure 3).

Fast speed is recommended for vacuum/shredding of light, dry leaves or debris on short or light density ground cover. It may also be used by experienced operators to move the Chipper Vacuum long distances.

⚠ CAUTION

Changing drive speed should only be done while the unit is stopped and the bail lever is completely released. Attempting to change drive speed while the unit is running may damage the transmission or cause premature wear of transmission and clutch components.

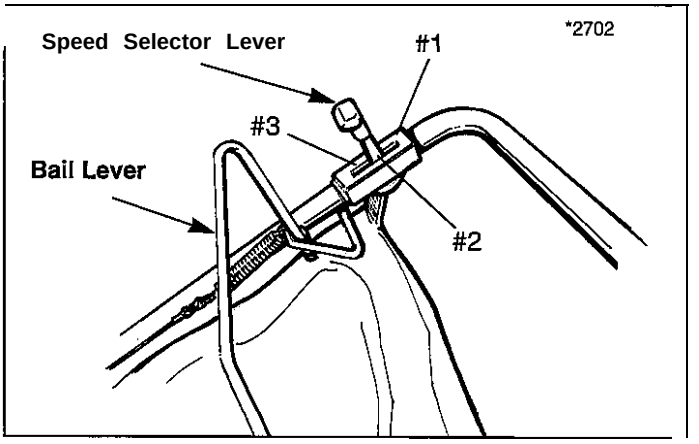


Figure 3. Speed Selector Lever And Positions

⚠ WARNING

Release the bail lever immediately to stop the forward travel of the unit if you see, step on, or suspect to encounter any dangerous debris such as rocks, gravel, glass, or other hard or sharp objects anywhere in the path of the Chipper Vacuum.

Clear the debris before proceeding, and dispose of the material properly to prevent contact with it again later.

Allowing the Chipper Vacuum to vacuum these types of materials may result in personal injury to the operator or bystanders, and will damage the shredding hammers, reducing shredding efficiency, and voiding the warranty.

CHIPPING

General

Variations in the size and hardness of the materials being chipped will affect how quickly the material is pulled in to the chipping knives. Small diameter softwood branches will chip more readily than larger diameter hardwood tree limbs, so be prepared for different feeding speeds when changing the type of material you are chipping. Kiln-dried dimensional lumber may be too hard to chip properly.

- Always maintain a stable, well-balanced stance to one side of the unit when operating the chipper (Figure 4).
- Never stand directly in front of the chipper cone when performing chipping operations, since occasional kick-backs or twirling of branches and limbs may occur, resulting in you being struck by the tree limb or branches.

- Hold tree limbs and branches carefully as they are being put into the chipper cone, releasing your grip as soon as the self-feeding action of the chipper knives begin to pull the material in.
- Longer pieces may have a tendency to twirl around forcefully as they are being drawn into the chipping knives. Hold the material safely away from the chipper cone area until the material is properly controlled by the chipper cone.
- Never wrap your fingers around tree limbs and branches, or hold so tightly that you can't let go quickly if the tree limb or branch is suddenly and forcefully pulled into the chipper block chipping knives. Short pieces may be pushed into the chipper using longer limbs and branches. Stand to the side when feeding shod pieces, since they may kick back.

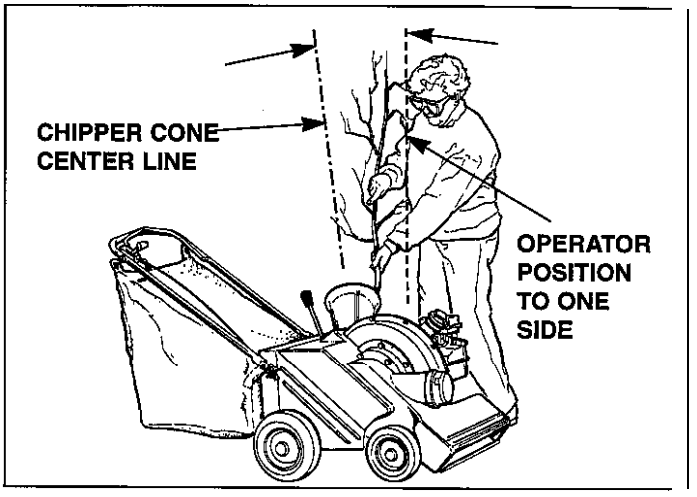


Figure 4. Proper Operator Stance For Chipping

Feeding Material

1. Prune tree limbs and large branches to limit size to the maximum diameter allowed. Pruning tree limbs and branches close to the main portion of the limb or branch will make feeding into the chipper cone easier, and will help you maintain control as the material is drawn into the chipper block.
2. Large, hard or dried-out tree limbs that tend to resist chipping can be processed by rotating them manually as you alternately insert and retract them in the chipper cone.
3. If the material to be chipped is extremely hard and kicks back forcefully, or cannot be easily controlled while it is being fed into the unit, remove the material immediately and set it aside. You may need to sharpen the chipper blades to process the material. Consult the repair section of this manual for sharpening instructions, *or* take your unit to an authorized service center.
4. If normal chipping operation begins to require additional feeding force to process material, the chipper knives may be in need of routine sharpening. See the repair section of this manual for sharpening instructions, or take your unit to an authorized service center.
5. Always try to maintain adequate control of the tree limbs and branches being fed into the chipper cone to prevent them from whipping around and causing injury to you or damage to the cone. Larger limbs and branches may have a tendency to kick back toward the operator, so always be alert as you feed materials into the cone. Always, feed the large end of the limb in first.
6. Avoid chipping limbs or branches that you suspect may have imbedded objects such as hooks, eyelets, nails, screws, or other metal items that could damage the chipping knives. If possible dispose of them using another means.
7. Check the chipper cone periodically to make sure it is securely fastened to the housing. If the chipper cone become loosened, stop the unit, and tighten assembly hardware securely.

FLEX HOSE VACUUM/SHREDDING

Vacuum/shredding of confined areas such as plant beds and decorative landscaping can be performed quickly and effectively using the 15' flexible vacuum hose available for your Chipper Vacuum.

Changing over to flex hose vacuuming can be done quickly and requires no tools.

To convert your unit for use with the 20' flexible vacuum hose, just follow these easy steps:

1. Shut the unit off if it is running, and allow the rotor *to* come to a complete stop. (Make sure any material being shredded or chipped is completely processed before stopping the unit.) When the rotor is fully stopped, no noise or vibration will be noticeable.
2. Set the vacuum intake nozzle flap adjustment to the closed position.
3. Remove the vacuum hose intake plug from the vacuum hose opening, and store it where it won't get damaged or lost (Figure 5). Placing the plug into the chipper cone opening will keep it readily available when you want to resume walk-behind vacuuming.

NOTE: When removing the vacuum hose intake plug or hose connector end, align the seam on the cap or hose connector with the seam on the vacuum intake opening, then pull out to snap it out of the intake opening groove, and unscrew to remove.

4. Insert the connector end of the vacuum hose into the intake opening, using care to fully seat the connector in the opening. If the connector is not fully inserted, and electrical interlock switch will keep the unit from starting or running (Figure 6).
5. Place the hand-held vacuum intake nozzle in the area to be vacuumed, using care to avoid twisting and minimize bends in the hose.
6. Visually inspect the area to be vacuumed to make sure it is clear of small pets, non-shreddable materials, and any other hazards that could damage the shredding hammers if vacuumed into the unit.
7. Perform the Checks Before Start-Up described earlier in this manual.
8. Stan the unit in accordance with standard starting instructions for the type of unit you have.
9. For maximum vacuum force, set the throttle control on the engine to the maximum speed setting.
10. To reduce vacuum force, adjust the moveable ring to gradually open the vacuum adjustment port (Figure 7).
11. Using the vacuum intake nozzle, vacuum the area you wish to clear, using care to avoid vacuuming rocks, gravel, and other hard or sharp objects that are not shreddable.
12. Use extra care near landscape borders that may be separating grassy areas from landscape rock or stone.
13. Se watchful for small children, pets or other animals that may enter the area.

⚠ WARNING

The chipper vacuum is equipped with an electrical safety interlock switch which prevents the unit from operating when the vacuum intake cap or hose is removed from the inlet opening. See your dealer if the safety interlock switch is not operating properly.

⚠ DANGER

Never reach into the shredding chamber area of an electric start unit unless the start key has been removed and the spark plug wire has been disconnected.

Always wear work gloves to protect your hands from sharp edges and objects that may have been vacuumed into the unit.

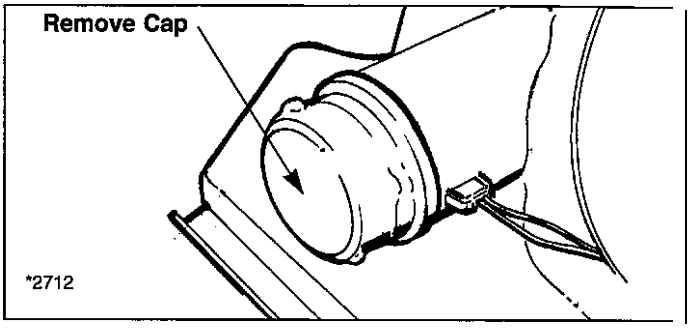


Figure 5. Remove Vacuum Hose Intake Cap

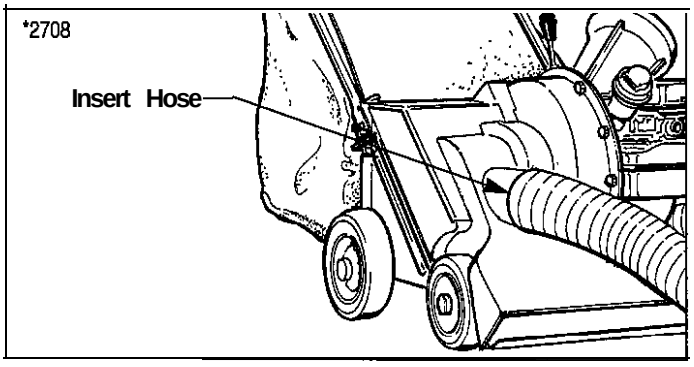


Figure 6. Insert Vacuum Hose Connector Into Hose Intake Opening

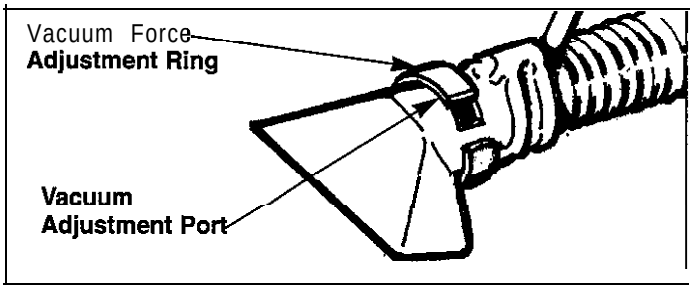


Figure 7. Vacuum Force Adjustment

SHUTTING DOWN

When you're done using the Chipper Vacuum, following these simple but worthwhile steps will help you shut down the unit properly so that your next use will be trouble-free.

⚠ DANGER

The engine and surrounding parts become extremely hot during normal use, and will cause serious burn injuries if touched before the engine has cooled. Allow the engine to cool completely before touching these hot surfaces.

1. When you have completed processing the materials to be chipped or vacuum/shredded, shut the unit off and allow the rotor to come to a complete stop before proceeding

2. Remove the spark plug wire from the spark plug to prevent the possibility of inadvertent starting. On electric-start models, remove the key to prevent anyone from inadvertently activating the electric start feature. Although the unit won't start with the spark plug removed, the rotor will turn, and serious injury could result if your hands are in the area of the rotor or chipper knives.
3. Inspect the following areas for any remaining materials that may have built up or become caught during operations:
   - vacuum intake nozzle
   - vacuum hose intake opening
   - chipper cone
   - discharge chute
   - engine air intake area
   - transmission/clutch area

NOTE: Do not spray water on the transmission to clean it, A/though it is sealed to protect it during normal use, doing so may force water into the transmission housing, causing corrosion or transmission failure. Use a small brush or air stream to clear debris away from this area.

MATERIAL COLLECTION & DISPOSAL

Direct Bagging

Chipped material may be collected using the discharge collection bag. Check the bag frequently to make sure it is filled to a level you can comfortably handle when removing and emptying the bag.

1. To remove the bag, shut the unit off, and let the rotor come to a complete stop. Unhook the rear and front support straps, (Figure 8), then loosen the cinch strap that holds the bag opening to the discharge chute. (Figure 9)
2. Pull the bag off and away from the discharge tube (Figure 10), and using both hands, grip the bag securely at the front and rear to balance the weight as you lift it.
3. Place the bag down in the disposal area, and unzip the zipper opening completely. Lift the bag by the other end and the contents of the bag should empty out easily.
4. Zip the bag closed, and reinstall in the reverse sequence followed for bag removal. Tighten cinch strap securely (Figure 11).

NOTE: The discharge bag may be emptied without removing the bag from the Chipper Vacuum by simply unzipping it and raking the material out by hand. This method is ideal for heavier debris that may make lifting and carrying the bag difficult.

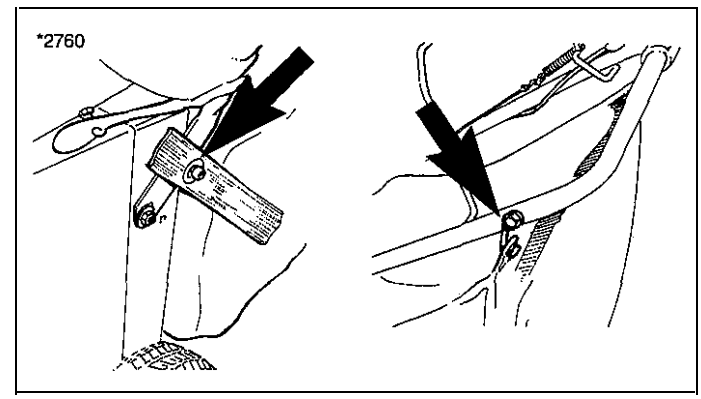


Figure 8. Unhook Support Straps

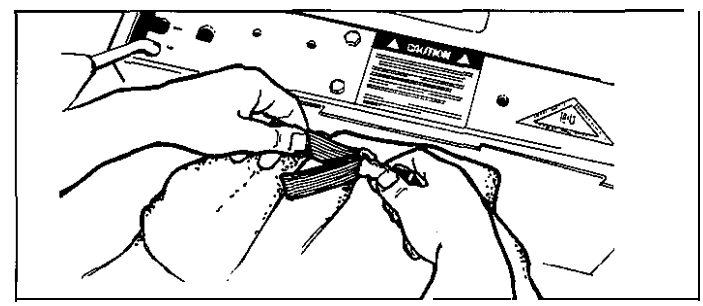


Figure 9. Loosen Cinch Strap

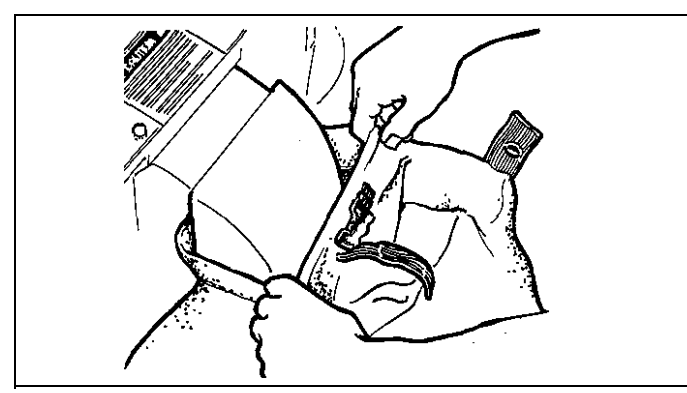


Figure IO. Pull Discharge Bag Off Discharge Tube

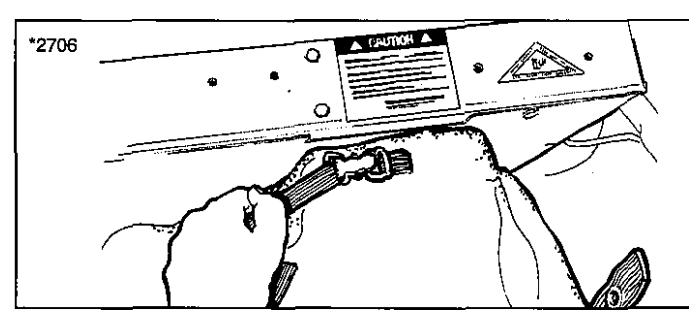


Figure 11. Tighten Cinch Strap Securely

Direct Discharge

Chipped material may be discharged directly into a preselected collection area by installing the discharge deflector elbow on the discharge chute. When direct discharge is being used, the deflector elbow must always be directed away from the operator.

A safe collection area should be located where children, pets, and bystanders will not come into contact with chipped material as it is being discharged, or be hit by deflected pieces that may ricochet away from the collection area with great force.

When using direct discharge, check the discharge area frequently for accumulation of material near the discharge port, and make sure the material can be safely ejected away from the unit. Letting material accumulate directly in front of the units discharge port may cause a jam.

Direct Discharge Blowing

The direct discharge method of clearing debris can also be used to clear driveways or other large areas. Make sure the discharge deflector elbow is directed to one side of the unit, then blow debris away from the center of the area toward the outer edges.

Do not discharge against a fence or wall where discharged material may deflect back toward you and possibly cause injury. If a wall, fence, or other obstacle is encountered while clearing an area, stop the unit, change the direction of the discharge stream, and blow debris away from the obstruction.

⚠ WARNING

Never attempt to move the unit while material is in chipper cone being chipped.

Always allow limbs and branches to be completely processed before engaging the power drive bail lever.

Failure to obey these instructions may result in jamming of the chipper, or erratic power drive performance causing sudden starting and stopping of the power drive.

⚠ WARNING

Never attach, remove, open or adjust the discharge bag while the unit is running. Always shut the unit off and allow the rotor to come to a complete stop.

Never start the unit without securely attaching the discharge bag or installing the discharge elbow in a safe direction. Failure to obey these instructions may result in serious injury.

OPERATOR ADJUSTMENTS

Three different suction control settings and three nozzle height positions provide a total of nine different positions for handling virtually any type of lawn surface and yard waste conditions.

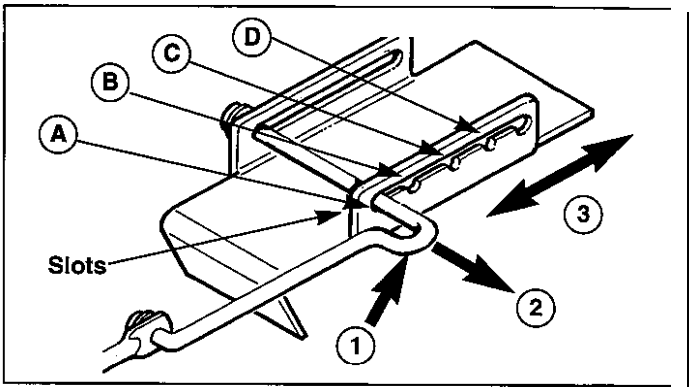


FIGURE 9. Variable Suction Control Adjustment
A. Closed Flap Opening - used with flexible hose
B. Narrow Flap Opening - light debris
C. Medium Flap Opening - small leaves
D. Wide Flap Opening - large leaves

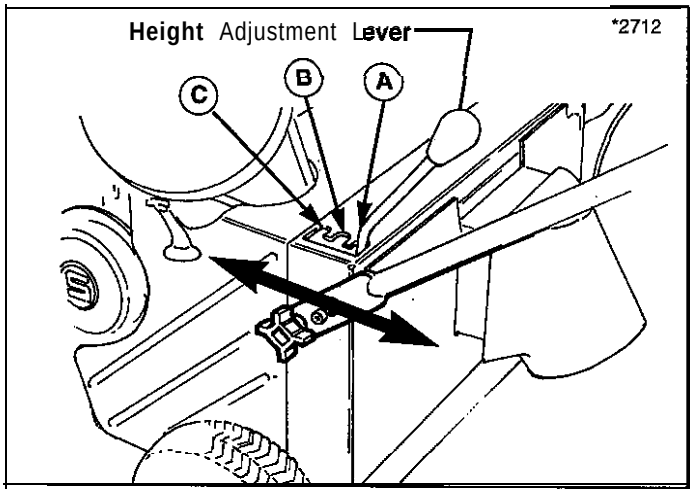


Figure 10. Vacuum Intake Nozzle Height Adjustment
A. High Height Adjustment
B. Medium Height Adjustment
C. Low Height Adjustment

Selecting the right combination of vacuum nozzle height and flap opening position may require a little experimenting to find the settings that work the best for you.

Variable Suction Control Adjustment

The variable suction control adjustment is located just above and to the rear of the vacuum intake nozzle. This adjustment sets the size of the intake opening, allowing you to match the vacuum suction force to the type of debris and grouna cover Deing vacuumed.

The vacuum intake nozzle flap has four easily-set positions: closed (for vacuuming using the flexible 20 hose), small, medium, and large. These positions are set and maintained by the vacuum nozzle flap adjustment bracket, using a simple pull-and-place lever that

slides smoothly into place in one of four slots (Figure 9). To adjust the opening of the vacuum intake nozzle flap:

1. Grip the curved portion of the lever arm,
2. Pull the lever out of the present slot,
3. Slide the lever into the desired slot.

Vacuum Intake Nozzle Height Position

The vacuum intake nozzle height adjustment is located at the rear of the frame on the left side of the unit (Figure 10). This adjustment controls the height of the vacuum intake nozzle above the ground.

SEASONAL HINTS

- Keep the lawn cut short during leaf clean-up season. Although your Chipper Vacuum is designed to handle tough clean-up jobs, you will save time and effort when the ground cover gets moist or matted if your lawn is mowed short.
- Vacuum frequently if your lawn is subject to a heavy deposit of leaves. Attempting to vacuum extremely thick deposits of leaves may require frequent stopping and starting to allow the unit to fully process the material in the shredding chamber.
- On extremely damp ground cover, leaves sometimes get vacuumed into the unit in large clumps. Go slow to avoid clogging the vacuum intake housing, and let the shredder fully process material before vacuuming additional debris.
- Frozen ground cover will require raking before vacuuming can be performed. Break up frozen clumps of leaves or other debris before attempting to vacuum the material.
- Extremely wet ground surfaces may impede wheel traction and make maintaining secure operator footing difficult. Allow surfaces to dry out before vacuuming if it is hard to maintain positive control of the unit.
- Operation on wet surfaces may result in a rapid build-up of debris on wheels and on the underside of the unit. Be sure to remove any build-up before putting the Chipper Vacuum away. Moist debris will be easier to remove than material that has been allowed to cake on the unit and dry.

* A light coating of WD-40 on drive chains will help prevent corrosion between uses if the unit has been subjected to extremely wet operating conditions.

PERFORMANCE TIPS

To help you get off to a great start and begin using your unit like a pro, we've put the following list of performance tips and hints together.

- If the grass is too long to vacuum leaves effectively, first cut and mulch the grass, and then vacuum.
- Wait for leaves to dry out, usually in mid to late afternoon, prior to pick-up.
- Clutch and de-clutch the traction drive lever (start and stop the power drive) if the shredding chamber begins to overload or the engine sounds overloaded.
- Start slowly (1st speed) and increase speed until vacuum nozzle no longer picks up all leaves. Then reduce speed by one gear.
- In thick or dense leaves, take only one-half the full width of the vacuum intake nozzle with each pass, or take two passes over the leaves. Take the first pass slowly, and the second at a faster pace.
- For best results, vacuum leaves frequently to avoid deep piles from accumulating on the lawn or to prevent leaves from matting or tangling in the grass.
- Use care when vacuuming near mulches, stones, gravel, etc. to avoid picking up these materials.
- It may be necessary to rake wet and/or compacted leaves from ditches prior to collecting them.
- Keep the discharge bag clean for best pick-up and air flow. It may be necessary to clean the bag frequently in dusty conditions. Use a shop vac, or the optional vacuum hose attachment. If you use the vacuum hose attachment, remember that what the hose vacuums in will be blown out of the discharge elbow - be sure to aim the discharge stream downwind and away from yourself and bystanders, open doors or windows, and vehicles that may be parked nearby.
- Small sticks can be processed by the handful in the chipper cone, and will yield less waste volume than sticks that are shredded in the shredding chamber.
- Travel in a straight line as you vacuum/shred, minimizing curves and corners. For particularly stubborn yard debris, making two passes at 90° to each other may help dislodge the material.

WASTE MATERIALS GUIDE

Your Chipper Vacuum is designed to efficiently process a wide variety of organic yard and garden waste materials. To obtain consistent performance, extend the life of your unit, and help ensure safe operation, do not attempt to process non-organic materials, and always follow the material requirements shown in the Waste Materials Guide below.

If you are unsure about processing a material not covered in the guide below, contact your local authorized dealer, or call our **Customer Service Department at 414-284-8786** for assistance before proceeding.

If you encounter any difficulties while processing any of these recommended materials, consult the troubleshooting sections of this manual for guidance and recommended corrective action,

OPERATION	TYPE OF WASTE PERMITTED	SIZE LIMITATIONS	SPECIAL NOTES
Power **Drive Vacuum/ Shredding**	Dry, moist, or wet organic material, including leaves, clippings, seeds, pine needles, cones, and other organic lawn debris that is shreddable Vacuum at drive speed and nozzle settings that consistently provide thorough material pick-up	Branches and twigs up to 1/4" diameter and 4" long. Fruit and vegetable waste that will pass through vacuum intake nozzle	Rake very wet materials to separate them from ground cover that may impede normal vacuuming operations. If time permits, allow wet material to dry out for a few days prior to vacuum/ shredding.
Chipping	Tree limbs, large branches, or small branches grouped together for ease of handling. Never use the chipper to chip very hard, dry materials such as kiln-dried dimensional lumber (2x4's, 1x2's, etc.), or other building and lumber yard materials. Never use the Chipper Vacuum to chip pressure-treated wood products such as landscape timbers, fence posts, or other outdoor building or landscaping lumber products.	3" Diameter limbs, branches, or small groups of branches. Avoid long pieces (over 6') as the outer end can twirl in a circular motion and strike you or bystanders, causing personal injuries. Maximum Diameter: Model 5/25 (2-1/2") Model 8/25 (3")	Bulky tree limbs and branches should be pruned close to the main stem to pass through the chipper cone properly. As the material is chipped, short lengths may be pushed into the chipper with another tree limb or batch of branches. **Never attempt to chip material suspected of containing nails, hooks, or other metal objects.**
Vacuum Hose Operation	Loose, dry waste such as leaves, grass clippings, seeds, pine needles, cones, and other organic lawn and yard debris. Avoid vacuum operation on areas where hard, non-organic materials such as gravel, dirt clumps, or other hard objects could get vacuumed into the shredder chamber.	Smaller materials that will not obstruct the vacuum hose as its being vacuumed.	The hose is designed for small, loose waste and for cleaning around decorative landscaping and flower beds.

SCHEDULED MAINTENANCE

Your Chipper Vacuum has been designed to provide you with years of reliable operation. Keeping your Chipper Vacuum in top running condition will prolong its life, and help you obtain optimum performance whenever you wish to chip or shred yard or garden waste. Please read this normal care schedule, and observe these recommended care operating intervals to extend the life of your unit.

Normal Care Procedures - Perform Each Item At Use Interval Shown

ITEM	Page	Each Use	5 Hrs	25 Hrs
Check For Loose Pans & Hardware	19	●		
Check Oil Level And Add As Req'd	*	.		
Change Oil	*			●
Change Spark Plug	*			●
Clean Engine Air Intake Area	20			.
Clean/Oil Air Filter Element	*		●	
Inspect/Rotate Shredding Hammers	20			.
Inspect/Sharpen Chipping Knives	20			●
Inspect/Adjust Drive Chains	33			.
Inspect Drive Belt	32			●
Inspect Starter Rope/Handle	20	●		
Inspect Chipper Cone	20	●		
Inspect Vacuum Nozzle & Housing	21	.		
Lubricate Wheels, Pulleys, & Sprockets	20			.
Check All Safety Labels	20	●		
Battery Maintenance (Electric Start Only)	21			.
Optional Vacuum Hose	21	●		

* See engine manufacturer's owner's manual supplied with the unit.

SERVICING THE CHIPPER VACUUM

General

The following information will help you make the necessary checks and perform the procedures required to follow the normal care recommendations made for your Chipper Vacuum unit,

If you prefer, your local authorized dealer can make these checks and perform the required procedures for you.

Read the engine manufacturer's owner's manual for any engine maintenance required.

Loose Parts And Hardware

Check the following areas, and tighten as required:

- Chipper cone and cone mounting
- Vacuum intake housing mounting
- Discharge deflector mounting
- Top and side covers

Clean Engine Air Intake Area

The engine is air-cooled, and requires unobstructed air flow into and around the engine. The cooling fins on the engine cylinder head area must also be kept clear of chipper and shredding deposits, as well as any other build-up of debris that could prevent heat from radiating away from the engine (Figure 14).

To clean the air intake area, remove any external material build-up, and then blow out the area using a stream of compressed air. If a compressor is not available, use a stiff-bristle parts brush, which is available at most auto parts supply stores.

To clean the cooling fins, brush the area between the fins with a stiff bristle parts brush, and blow out any remaining debris with a stream of compressed air. If the cooling fins are caked with an oily build-up of debris, using a commercially available engine cleaner aerosol may help loosen and remove the deposits. If you use such a product, you must follow all safety and use instructions to prevent damage to the engine components and personal injury to you.

Using a stream of water to clean the engine requires immediate drying of engine components to prevent rusting and possible malfunctioning of the electrical system. If a water stream is used to clean debris, start the engine immediately, and allow engine heat to speed drying.

Inspect Starter Rope/Handle

The recoil starter rope and handle should be inspected for signs of abrasion or wear that could result in breakage.

Contact your local authorized dealer for replacement if these parts need to be replaced.

Inspect/Rotate/Replace Shredding Hammers

Consult the Troubleshooting and Repair Section of this manual for complete disassembly, inspection, and replacement instructions.

Your local authorized dealer can provide this service to you if you do not wish to disassemble the unit and inspect/repair it yourself.

Inspect/Sharpen Chipping Knives

Consult the Troubleshooting and Repair Section of this manual for complete disassembly, inspection, and replacement instructions.

Your local authorized dealer can provide this service to you if you do not wish to disassemble the unit and inspect/repair it yourself.

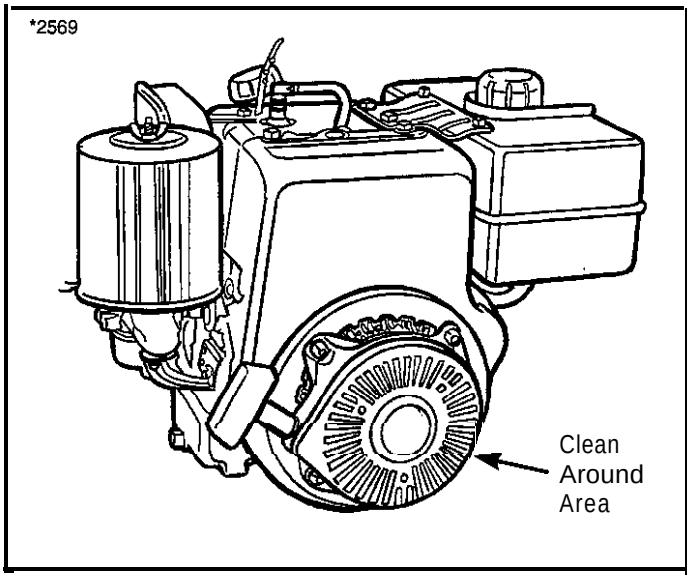


Figure 14. Engine Air Intake Area

Inspect Chipper Cone

Check the cone to make sure that it hasn't been damaged or worn excessively by constant use, and replace it if it is cracked, worn out, or no longer fits securely on the chipper cone mounting flange.

Cracks, worn areas, and loose attachment points can cause material to jam or clog when feeding it into the machine, and may result in kick-back or other hazard to the operator.

Contact your local dealer for replacement parts if your unit shows any evidence of these problems, and discontinue use of the unit until the appropriate repairs can be made.

Check Safety Labels

The safety labels located in various positions on the Chipper Vacuum have been placed to help remind you of important safety rules while you are operating or transporting the Chipper Vacuum unit.

If any label can't be read or is missing, contact your local dealer for an immediate replacement. If you must use the unit without the label, review the label information in the "Safety Decals" section of this manual.

Lubricate Wheels, Pulleys, and Sprockets

To lubricate, squirt 3-5 drops of SAE 30 oil on each wheel axle at the wheel bearings, and at each bearing on the pulleys and sprockets. Wipe up any run-off and spin wheels briefly to work oil around entire axle

Inspect Vacuum Nozzle Housing

Check the vacuum nozzle housing for build-up of debris,

and clean out if required. Always shut engine off and remove the spark plug wire from the spark plug before reaching into the housing to clear material.

For stubborn debris, the vacuum nozzle housing can be removed from the unit following the steps in the hammer service section of this manual, and hosed out with a garden hose.

Inspect Vacuum Hose (Optional)

Repetitive use may result in a build-up of debris on the inner walls of the flexible vacuum hose. If this occurs, remove the hose from the unit, and rinse out with a garden hose. Allow the hose to dry before reusing. Inspect the hose for any sticks or small branches that may have become lodged inside, and remove.

BAG CARE

The discharge bag is designed to allow air to pass freely through the material, while safely retaining discharged material from the chipper and shredding chamber. Use of the Chipper Vacuum in extremely dusty or dry conditions may cause a build-up of fine debris on the bag fabric, reducing the air flow and the efficiency of the vacuum action. If this occurs, remove the bag from the unit and turn it inside out, and brush or vacuum it clean. If you have purchased the hose kit accessory, you can use the hose kit to vacuum the bag clean.

BATTERY MAINTENANCE
(Electric Start Units Only)

Checking Battery Fluid Level

Check the battery fluid periodically to make sure that the fluid level is maintained at the "full" mark. Allowing the fluid levels to run down below full may result in erratic starting performance, or inability of the battery to provide adequate power to operate the starter motor.

To check battery fluid:

1. Remove the top cover.
2. Remove battery filler cap. Battery fluid must be even with split ring "full" mark. If necessary, add distilled water to bring fluid level up to full level.
3. Reinstall battery filler cao

Checking/Cleaning Battery Cables

1. Disconnect the cables from the battery, negative cable first.
2. Clean the battery terminals and cable clamps with a wire brush and battery post terminal cleaner.
3. Reconnect cables, positive cable first.
4. Coat cables and clamps with grease, petroleum jelly, or a protective aerosol spray coating designed to provide a protective barrier on electrical connections.

⚠ WARNING

When removing or installing battery cables, disconnect the negative cable FIRST, and reconnect it LAST. If not done in this order, the positive terminal can be shorted to the frame by a tool, creating a dangerous spark that can ignite fuel vapors or escaping hydrogen from the battery.

⚠ WARNING

Lead-Acid batteries contain sulphuric acid, a highly corrosive liquid that can cause severe chemical burns if allowed to come into contact with skin, or blindness if allowed to contact your eyes. Always wear eye goggles and protective gloves when handling or servicing the battery.

Lead-acid batteries also produce hydrogen, a colorless, highly explosive gas that can be easily ignited by a single spark. Always disconnect the negative cable first and reconnect it last to prevent a spark from occurring if a tool accidentally contacts the positive terminal and any part of the machine frame at the same time.

Never smoke or allow ignition sources to be nearby while servicing the battery.

Never attempt to charge a discharged battery without first checking the fluid level and making sure the fluid is to the full level.

Storage

TEMPORARY STORAGE

(30 Days Or Less)

Here's a quick checklist of things to do when storing your Chipper Vacuum temporarily, or between uses:

- Keep the unit in an area away from where children may come into contact with it.
- When this equipment is stopped for service, inspection, or storage, or to change an accessory, operators shall make sure the spark plug wire is disconnected from the spark plug.
- Remember, the Chipper Vacuum fuel tank probably will still contain some gasoline, so never store the Chipper Vacuum indoors or in any other area where fuel vapor could travel to any ignition source. Fuel vapor is also toxic if inhaled, so never store the Chipper Vacuum in any structure used for human or animal habitation.
- Never put the unit away while the engine is still hot from running. Let the engine cool down first to prevent the chance of fire.
- Never try to lift or position the unit in the storage area by holding the fuel tank. Always let the engine and muffler cool completely before allowing yourself to contact these parts.
- If the unit can't be stored on a reasonably level surface, use a block of wood to chock the wheels. Never store the Chipper Vacuum where it will not be in a stable position.
- Never tip the unit more than 45" from vertical, and never lay the unit on its side, as this could cause fuel leakage, and/or undesirable oil transfer into the cylinder head and spark plug area. Excessive oil in the cylinder head will prevent the engine from starting properly.
- Cover the Chipper Vacuum unit to protect it from debris and foreign objects.
- Avoid damp storage locations to prevent rusting of metal parts.
- When this equipment is stopped for service, inspection, or storage, or to change an accessory, operators shall make sure the spark plug wire is disconnected from the spark plug.
- Drain fuel system completely following engine manufacturer's instructions or add fuel stabilizer to prevent fuel from gumming up during extended storage period.
- Clean external surfaces, engine and cooling fan.
- Remove spark plug, and squirt 1 ounce of SAE 30 oil into spark plug hole.
- Plug hole and pull starter cord slowly or crank engine briefly to distribute oil evenly in cylinder head area.
- Reinstall spark plug.
- Transport unit to a suitable storage location. If you have chosen to use a fuel stabilizer and have not drained the fuel system, follow all safety instructions and storage precautions in this manual to prevent the possibility of fire from the ignition of gasoline fumes. Remember, gasoline fumes can travel to distant sources of ignition and ignite, causing risk of explosion and fire.
- For additional convenience and a reduction in the amount of floor space required for storage, the handle assembly may be moved to a vertical position by removing the locking knobs and carriage bolts, loosening the bag support cap screws, and rotating the handle up toward the unit. Be sure to keep the locking knobs and carriage bolts with the unit for reinstallation when the unit is put back into service.

LONG TERM/SEASONAL STORAGE

(Longer Than 30 Days)

Your Chipper Vacuum can be safely stored during off-seasons by following these simple storage instructions:

- For extended storage periods, run the unit dry of gas.

Electric Start Units Only

- Be sure the battery is fiiled to the proper level with water and is fully charged. Battery life will be increased if the battery is removed and put in a cool, dry place and fully charged about once a month. If the battery is lefi in your unit, disconnect the negative cable to prevent battery drain during storage.

GENERAL TROUBLESHOOTING

The troubleshooting guide below lists the most common problems, causes and remedies.

See the service information on the following pages for instructions on how to do most of these minor repairs yourself. If you prefer, all of these procedures can be performed for you by your local authorized dealer.

⚠ WARNING

Never attempt to perform any of these procedures with the engine/motor running. Always turn the unit off, let the rotor come to a complete stop, and disconnect the spark plug wire or power cord before attempting to correct any operatmg problems.

Failure to comply with this safety requirement can result in serious personal injury to you or bystanders.

Engine won't start.	• Out of gas. • Spark plug wire disconnected. • Engine controls set wrong. • Spark plug fouled. • No compression - rope pulls without resistance. • No spark - electrical system problem. • Safety switch open.	• Add gas. • Connect spark plug wire. • Check engine controls and adjust. • Remove spark plug, clean, and replace. • See your local dealer. • See your local dealer. • Check safety switch.
Engine runs, but rotor won't turn.	• Crankshaft key broken or not installed.	• Replace crankshaft key.
Engine runs, rotor turns, but no material is being discharged.	• Discharge chute clogged. • Engine not running at full RPM.	• Clear discharge chute. • Adjust throttle to "Fast" (3700rpm)
Excessive branch vibration when chipping materials.	• Chipper knives dull. • Tree limbs and branches are extremely hard or dried out.	• Sharpen or replace knives. • Material too dried out or hard for chipping - use for firewood.
Unusual noise or vibration when processing material.	• Rotor overloaded with material. • Non-organic matter caught in shredding chamber. • Chipper knives dull or loose. • Hammers, broken, bent, or loose. • Hammers frozen on shaft. • Crankshaft bent.	• Allow unit to clear itself before vacuuming more material. • Follow shut-down procedure and remove material from unit. • Sharpen or tighten knives Securely. • Check for proper assembly or replace. • Check for obstructions and remove debris from hammer pivot areas. • See your local dealer for factory authorized repair.
Vacuum intake nozzle not working.	• Housing plugged with debris. • Nozzle set too high for terrain. • Flap not set to correct opening. • Drive speed set too fast. • Debris too wet. • Debris layer too thick.	• Stop unit - clean out housing. • Adjust - see adjust. procedure. • Adjust - see adjust. procedure. • Reduce speed. • Allow to dry - rake to separate. • Reduce path width to112 nozzle.

POWER DRIVE TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	REMEDIES
Power Drive won't engage.	• Bail lever cable too loose. • Bail lever cable end not engaged in clutch lever. • Drive belt broken or loose. • Drive chain(s) broken. • Drive chain(s) off sprocket. • Crankshaft key broken or missing from unit. • Clutch lever obstructed.	• Move clip up to next link. • Insert cable end in clutch lever. • Repair or replace. • Repair or replace. • Reinstall chain(s) on sprocket. • Replace key. • Clear obstruction.
Power drive runs erratically.	• Drive belt worn.	• Replace drive belt.
Drive chains chatter.	• Drive chains loose.	• Adjust sprocket position.
Unusual noise or vibration while unit is moving.	• Rotor overloaded with material. • Non-organic matter caught in shredding chamber.	• Allow unit to clear itself before feeding more material. • Follow shut-down procedure and remove material from unit.

ELECTRIC START TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	REMEDIES
Electric start won't operate..	• Battery dead. • Circuit breaker tripped. • Battery terminals dirty. • Loose wires/battery cables. • Ignition switch inoperative. • Solenoid inoperative. • Safety switch inoperative. • Starter motor inoperative.	• Charge Battery. • Allow 1 minute for auto. reset. • Clean terminals. • Check wiring and tighten as required. • Repair or replace switch. • Repair or replace solenoid. • Repair or replace switch. • Repair or replace starter motor.

OPTIONAL VACUUM HOSE TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	REMEDIES
Vacuum hose not working.	• Vacuum intake nozzle flap open, • Material too wet. • Hose not attached securely. • Hose obstructed or damaged. • Engine not running at full RPM. • Hose nozzle vacuum adjustment ring opened too far.	• Close vacuum intake nozzle flap. • Allow material to dry. • Attach hose securely. • Inspect hose - repair or replace. • Set control to full fast position - See dealer if problem persists. • Close adjustment ring.

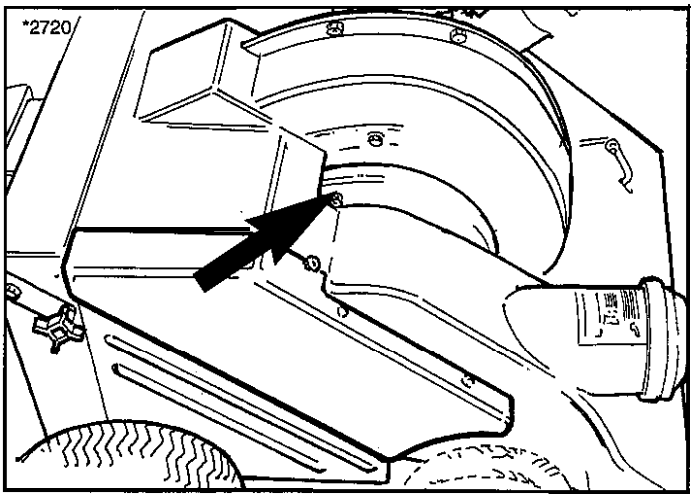


Figure 15. Remove Cover Panel Fasteners

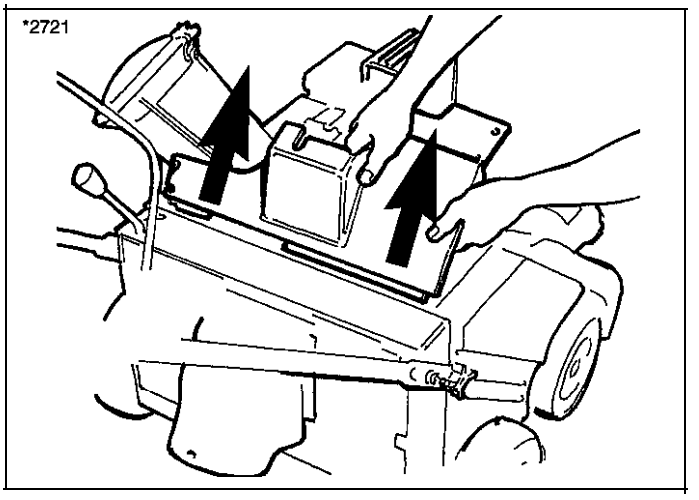


Figure 16. Lift Top Cover Up And Away From Unit

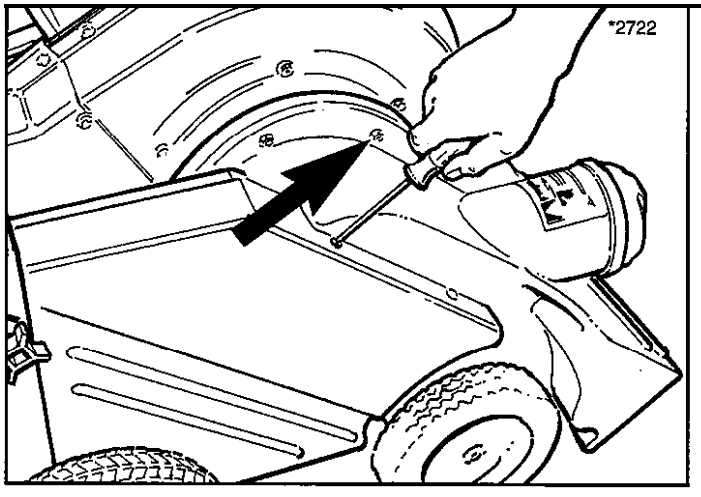


Figure 17. Remove Right Cover Panel Fasteners

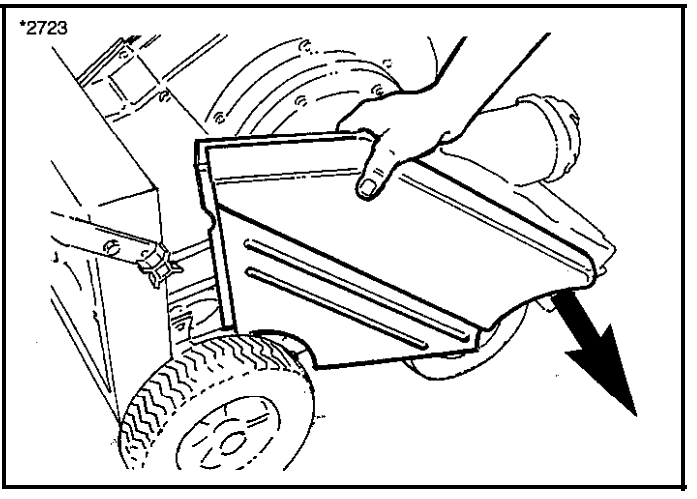


Figure 16. Remove Right Cover

SHREDDING HAMMERS

1. Turn the unit off, allow the rotor to stop completely, and disconnect the spark plug wire.
2. Remove top cover by prying up panel fasteners with a flat blade screwdriver. Pry panel fastener heads up to permit gripping with fingers, then pull fastener heads to remove fastener (Figure 15).
3. Lift top cover up and away from unit (Figure 16).
3. Remove (2) panel fasteners and (2) #10 x 5/8" slotted, hex head screws from right side panel (Figure 17), and remove panel from unit (Figure 16).
4. Pull on spring loaded idler to lessen belt tension and remove belt from pulley. Using a 1/2" socket wrench, remove the (2) 5/16-16 x 3/4" hex head cap screws and (2) 5/16 lock washers that secure the drive pulley bearing plate to the frame (Figure 19).

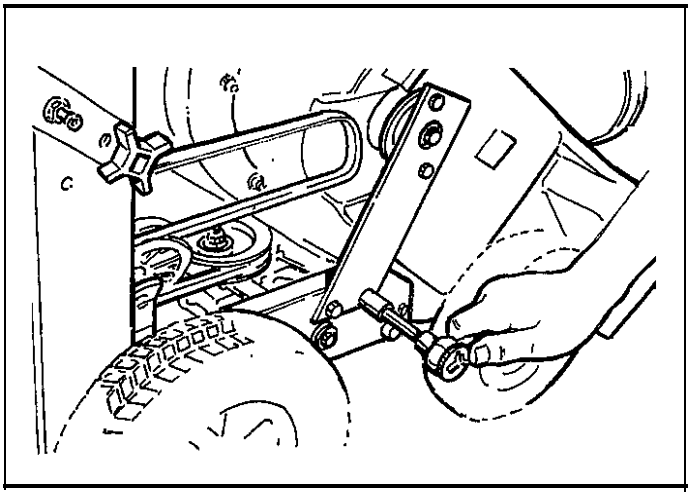


Figure 19. Remove Drive Pulley Bearing Plate Screws

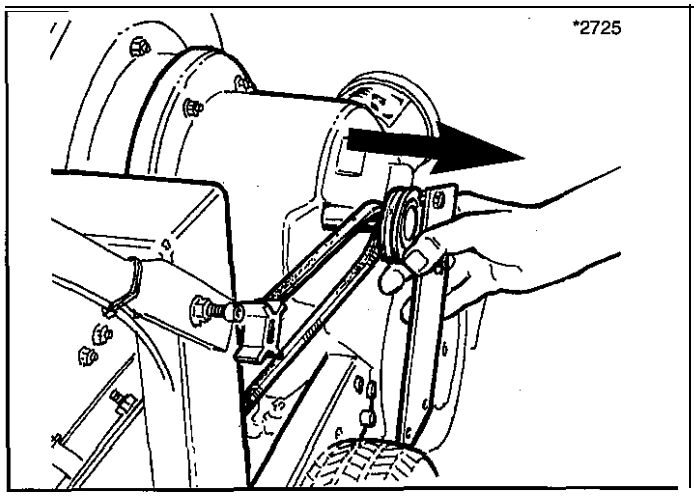


Figure 20. Pull Drive Pulley Bearing Plate And Slide Drive Belt Off Pulley

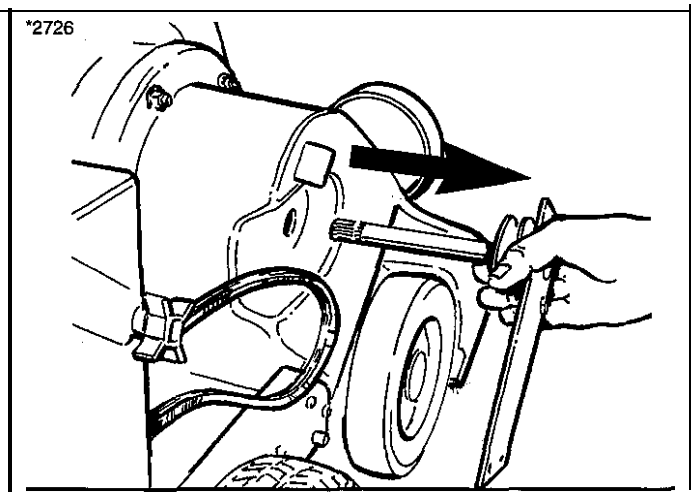


Figure 21. Pull Drive Pulley Bearing Plate Assembly Out Of Vacuum Nozzle Housing

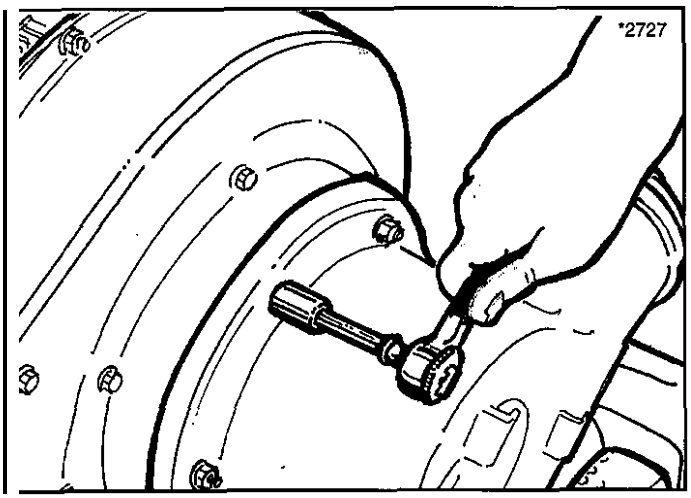


Figure 22. Remove Vacuum Nozzle Housing Nuts

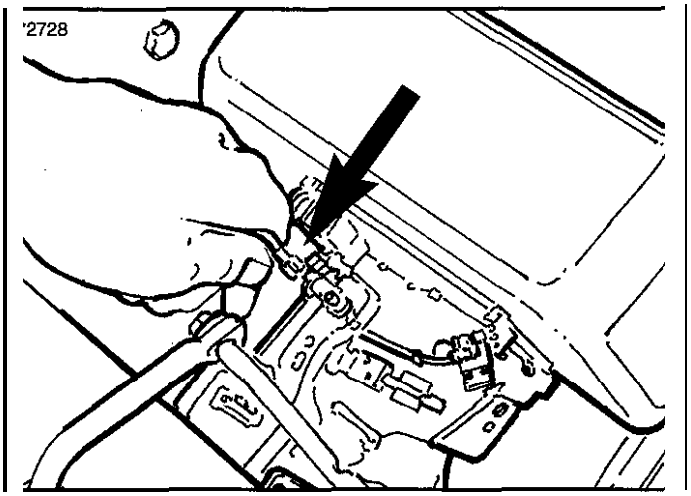


Figure 23. Pull Off Safety Interlock Wire At Spade Terminal

5. Pull the drive pulley bearing plate straight out, and lift the drive belt off the pulley to permit complete removal of the plate assembly (Figure 20). It may be necessary to tap the plate with a hammer to help free it from the splined hub assembly on the rotor.
6. Continue pulling the drive pulley bearing plate straight out, and remove it from the vacuum nozzle housing. Note that the shaft end is splined to mate with the splined hub assembly on the rotor (Figure 21).
7. Using a 1/2" socket wrench, remove the (4) 5/16-18 hex nuts that secure the vacuum nozzle housing to the shredder housing (Figure 22).
8. Remove the safety interlock leads from the spade terminal (Figure 23), and engine block base (Figure 24). A 1/2" socket and 1/2" box wrench are required to remove the hex nut and hex head screw.

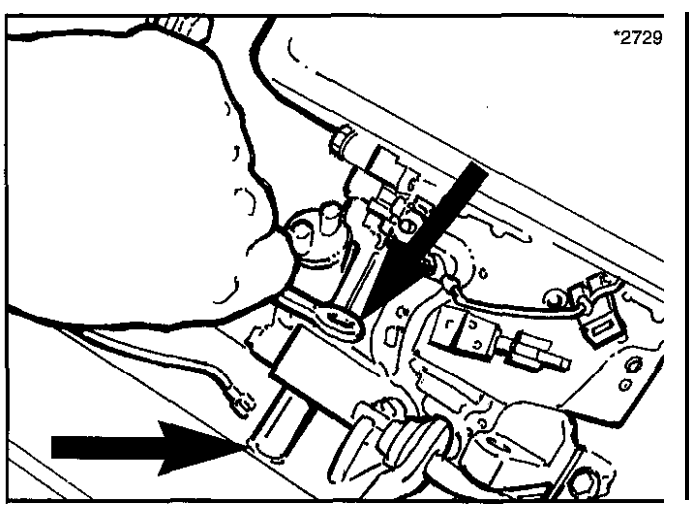


Figure 24. Remove Hex Nut And Screw Securing Safety Interlock Wire #2 To Engine Block Base

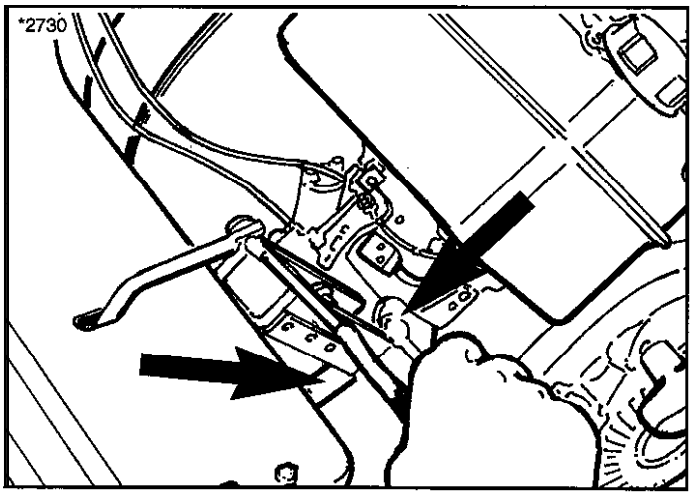


Figure 25. Disassemble Variable Suction Adjustment Control Bracket From Engine

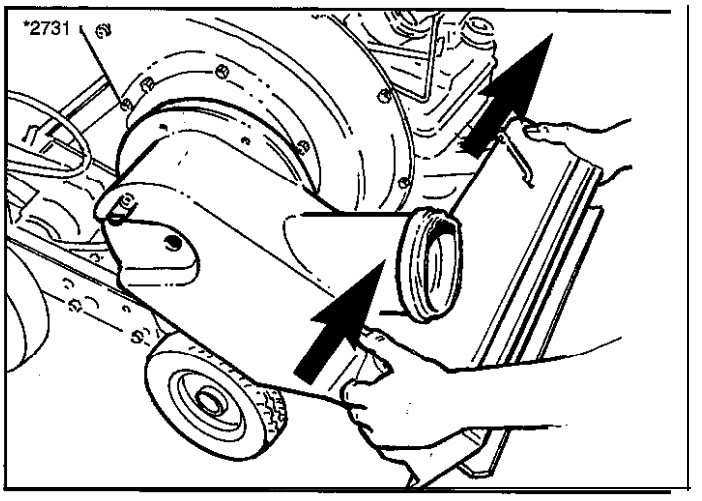


Figure 26. Remove Vacuum Nozzle Housing

9. Using a 1/2" socket wrench and 1/2" box wrench, remove the hex head screw and hex nut that secures the variable suction adjustment control bracket to the engine block base (Figure 25).

10. Lift the vacuum nozzle housing away from the shredder housing and tilt it up slightly to clear the right front wheel as it is removed from the unit (Figure 26).

11. Removal of the vacuum nozzle housing provides access to the shredding hammers. Inspect the J hammers and triangular hammers for wear, and replace if worn excessively (Figure 27).

12. Using a 5/16" allen wrench or hex bit socket, remove the capscrew that secures the J hammer *to* the rotor. It may be helpful to use a short piece of 2 x 4 lumber to block the rotor while removing the capscrew (Figure 26).

NOTE: The correct assembly sequence of parts is shown in Figure 29. All parts must be reinstalled in the correct order and location to ensure proper rotor balance, shredding efficiency, and safety, Use care to catch the parts as the capscrew is removed.

13. Install the new J hammer with the bent lip facing out as shown in Figure 26. (J hammers on this unit cannot be turned over and reused.) Use new assembly hardware if the old hardware appears worn out or damaged. Replace the other J hammer in the same manner.

14. To provide a new cutting edge on the triangular hammer, remove the hammer and reinstall it on a new pivot hole. If all cutting edges on the front surface are worn, turn the triangular hammer over and reinstall it. Tighten all capscrews securely when reassembling, but do not exceed 45 ft. lbs./ torque.

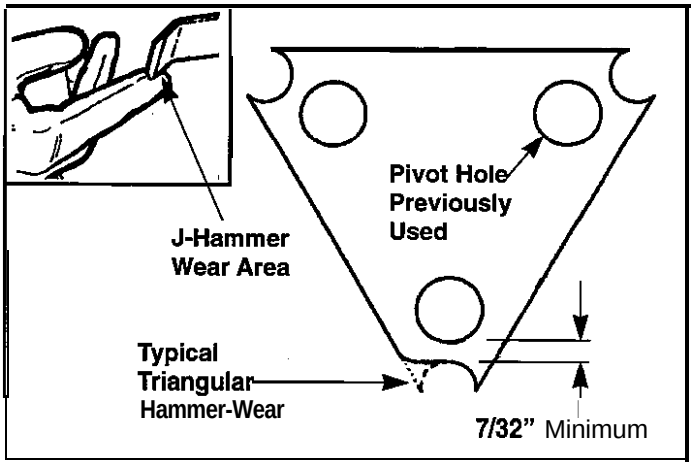


Figure 27. Inspect Hammers For Wear

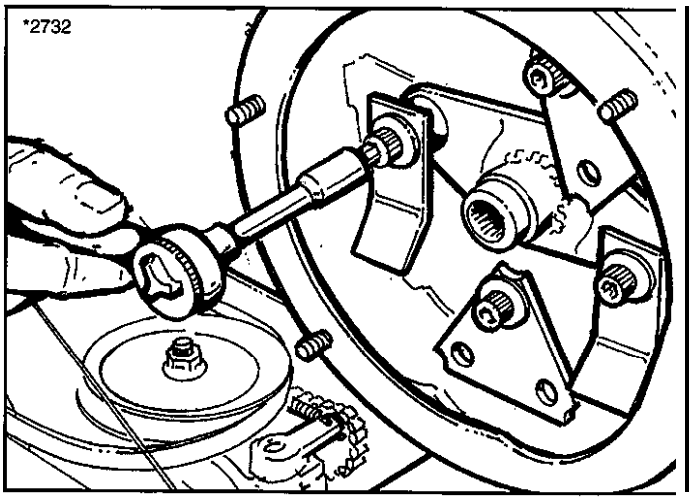


Figure 28. Remove And Replace Hammers

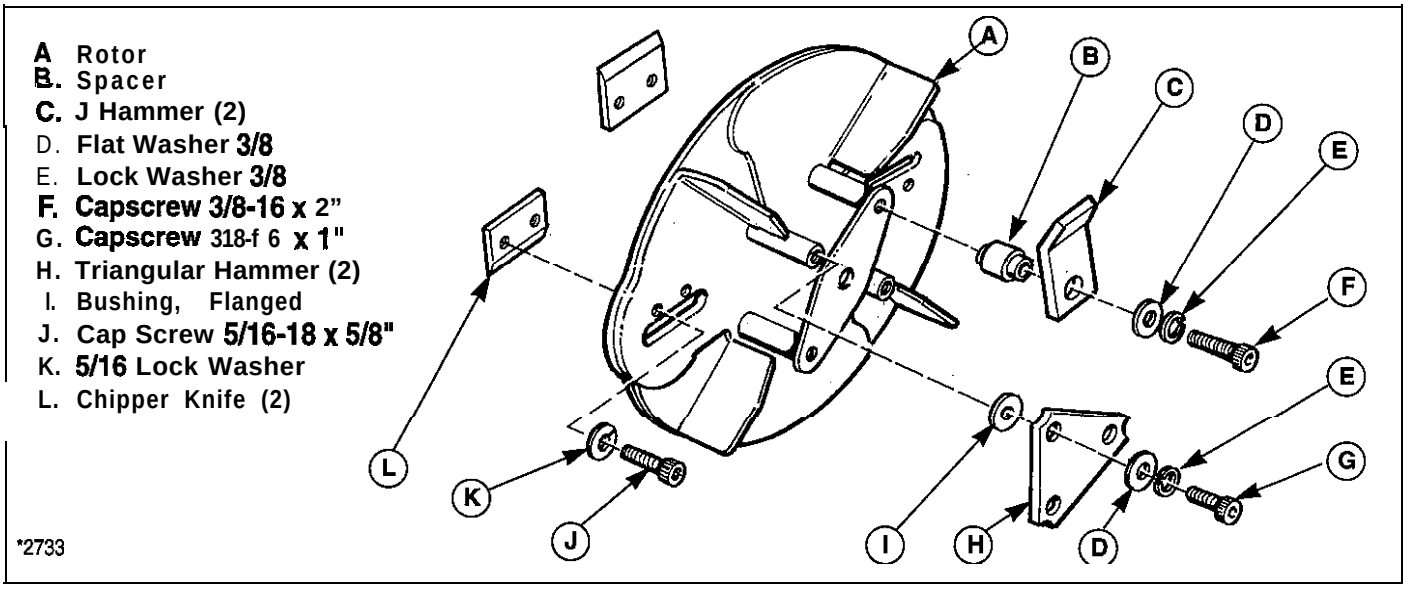


Figure 29. Proper Hammer Assembly

15. Rotate the rotor to move the next hammer into position for servicing, and repeat step 14.
16. If chipping knives are to be inspected or serviced, go to the next section for instructions. If service is to be performed on shredding hammers only, proceed to the next step.
17. Reassemble the unit in the reverse sequence used to disassemble it in the preceding steps.
18. Check all hardware for tightness and correct assembly before attempting to start the unit. Do not attempt to start the unit if extra hardware or other parts are left over after reassembly has been completed. Identify the correct assembly location for any remaining parts using the illustrations in the manual, and install as required.
19. Start the unit and listen for unusual noise or vibration. Stop the unit immediately if any problems are apparent, and check the assembly of all parts for proper positioning before starting the unit again.

⚠ WARNING

Never use the unit for chipping or vacuum/shredding unless the discharge bag is attached, or the deflector elbow has been installed.

Material could be ejected out of the discharge chute with great force, injuring you or bystanders.

⚠ WARNING

Chipper knife cutting edges are sharp. Wear leather work gloves to protect your hands from injury when removing or installing chipper knives.

CHIPPING KNIVES

Chipping knives should be resharpened or replaced when tree limbs and branches begin to require extra force to feed into the chipper block.

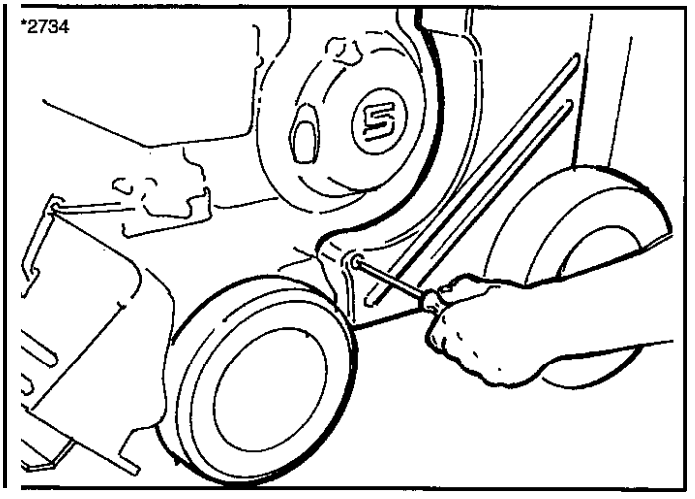
To inspect and service the chipping knives, follow these steps: (If hammer service has just been performed, skip steps 1 - 2).

1. Turn the engine off, allow the rotor to stop completely, and disconnect the spark plug wire.
2. Remove the top and right side covers as shown in the preceding hammer replacement section.
3. Remove the discharge bag.
4. Remove the panel fastener and slotted hex head screws from the left cover (Figure 29).
5. Remove the left cover (Figure 30).
6. Remove the panel fasteners from the rear panel (Figure 31).
7. Slide the rear panel down, and tilt the rear of the unit up slightly to allow the panel to slide free of the grooves in the discharge tube (Figure 33).

7a. Electric start units only: Disconnect and remove the battery.

NOTE: Always remove the negative terminal cab/e first and reinstall it last to reduce the risk of sparking and short-circuiting the battery if metal-to-metal contact is made between the positive terminal and the unit's frame.

7b. 8 H.P. units only: Remove top screws securing the fuel tank to the frame, and carefully move fuel tank forward and rest it on drive belt while chipper knife service is being performed.



igure 30. Remove Left Cover Panel Fasteners

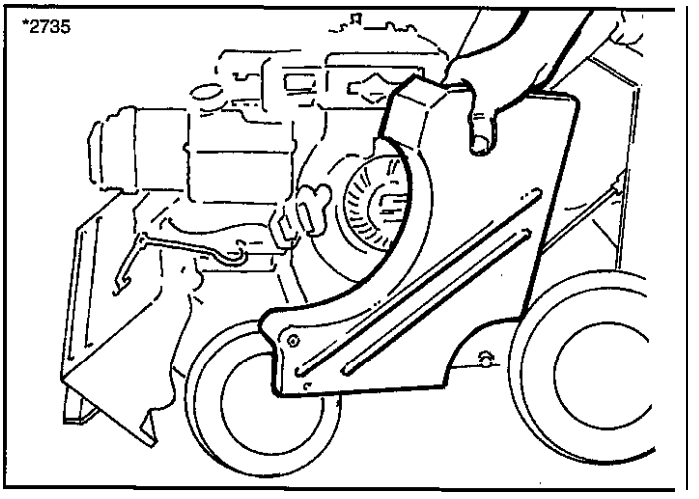


Figure 31. Remove Left Cover

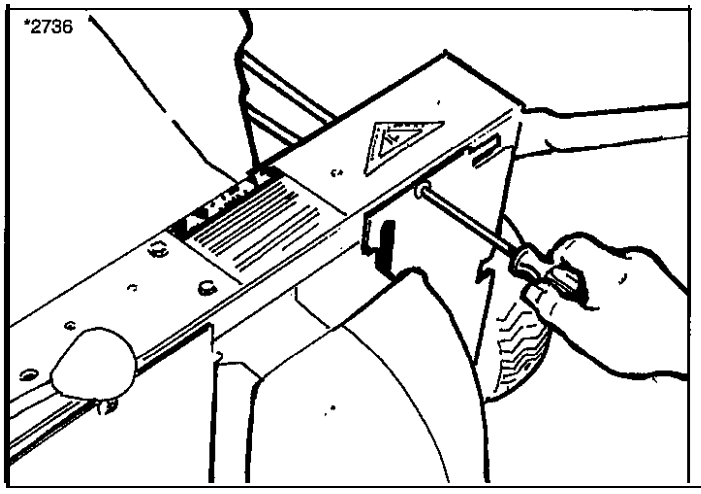


Figure 32. Remove Rear Panel Fasteners

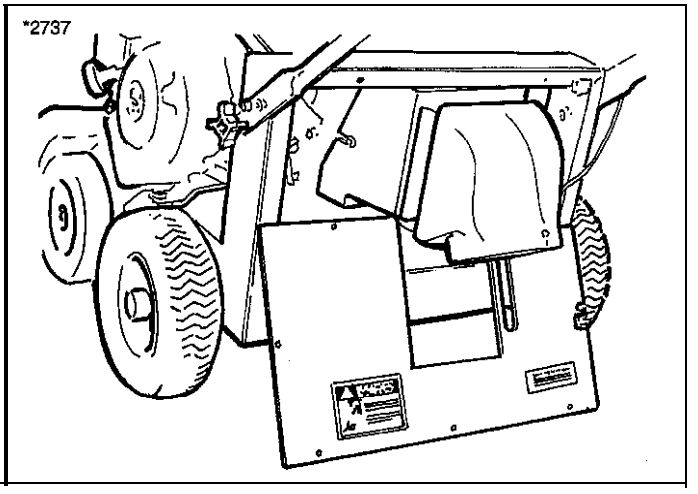


Figure 33. Remove Rear Panel

8. Loosen the discharge tube hex nuts on the right side of the discharge tube, providing approximately 1/8" clearance between the hex nut and the tube (Figure 34).
9. Using a 1/2" socket wrench and 1/2" box wrench, remove the hex head cap screw and hex nut securing the discharge tube to the top brace (Figure 35).
10. Loosen the discharge tube hex nuts on the left side of the discharge tube, providing approximately 1/8" clearance between the hex nut and the tube (Figure 36).
12. Slide the discharge tube away from the mounting studs on the shredder housing, and remove the tube through the opening in the back of the frame (Figure 37).

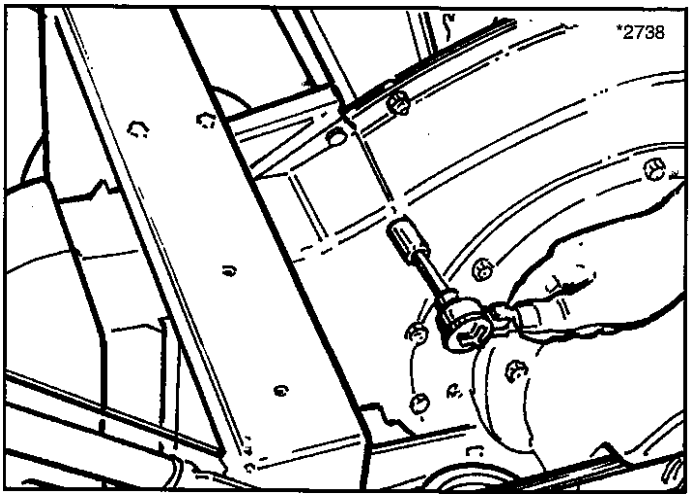


Figure 34. Loosen Discharge Tube Hex Nuts

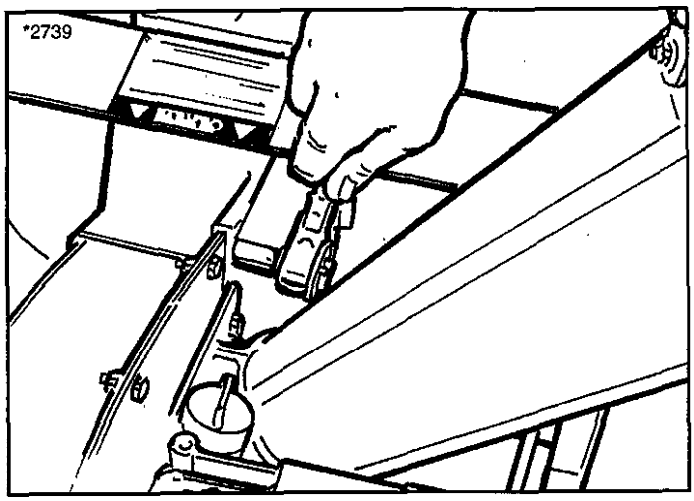


Figure 35. Remove Discharge Tube Hex Head Cap Screw And Hex Nut

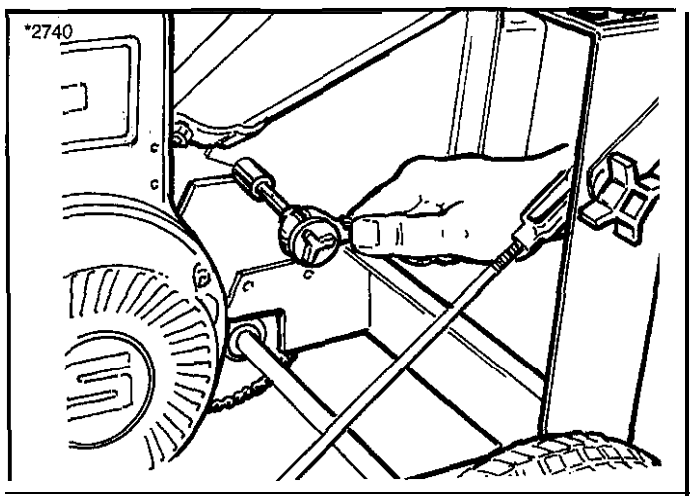


Figure 36. Loosen Discharge Tube Hex Head Nuts - Left Side

13. Rotate the rotor to move the first chipping knife into position at the rear opening in the shredding chamber. Pulling slowly on the starter rope will make the rotor rotate.
14. Insert a 1/2" thick x 1 1/2" - 2" wide x 10 - 12" long piece of wood into the chipping/shredding chamber under the sharp edge of the chipper knife. This will support the knife as it is disassembled from the rotor, and prevent the rotor from turning as the mounting screws are removed.
15. Using an allen wrench or hex bit socket, unscrew the two cap screws that secure the chipper knife to the rotor. It may be helpful to clean out the sockets on the cap screws with a smaller allen wrench or piece of bent wire before attempting to remove the screws (Figure 38).
16. Carefully remove the chipper knife by pulling the board slowly out of the chipping/shredding chamber. Avoid touching the sharp edge of the blade with bare hands as even a "dull" chipping edge can inflict a serious cut.
17. Rotate the rotor and remove the other chipper knife following the same procedure.
18. Sharpen both knives equally or replace both to ensure proper balancing and correct chipping action.
    - Chipping knives may be resharpened until the distance between the mounting holes and the top edge of the blade bevel is 1/16" apart (Figure 39).
    - Slow speed water-cooled grinding is suggested to help maintain blade temper and a long lasting sharp edge. Rapid grinding and heating of blades will soften the edges, making repeated sharpening necessary.

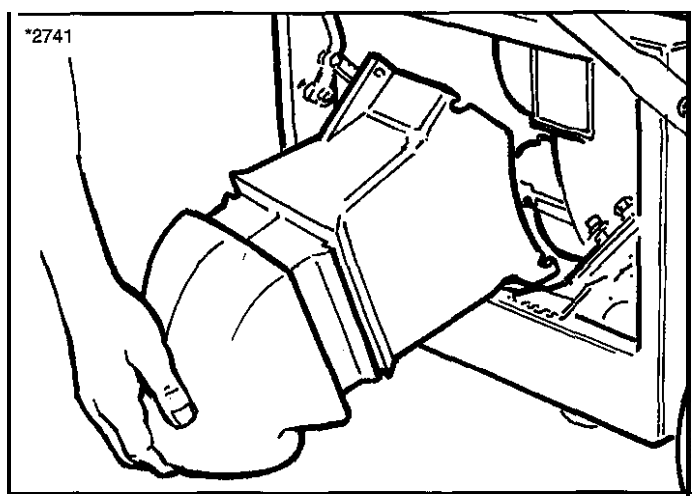


Figure 37. Remove Discharge Tube

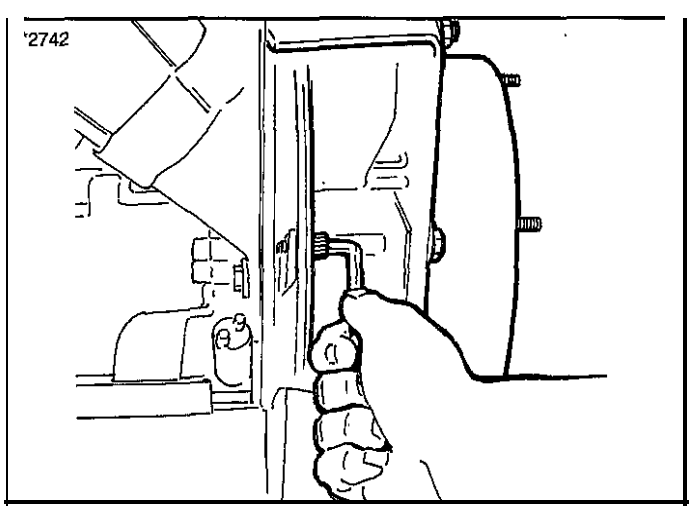
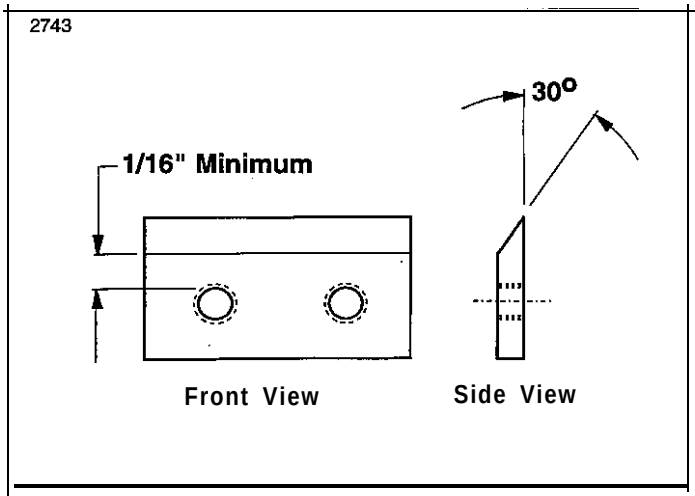


Figure 36. Remove Chipper Knives



gure 39. Chipper Knife Minimum Distance - ounting Holes To Bevel Edge

- Chipper knives require a 30” bevel on the cutting edge (as shown in figure 39) for efficient chipping action.
- Contact your local dealer or blade sharpening service if you prefer not to sharpen the blades yourself.

19. Clean the chipper knife mounting areas with a flat scraper before reinstalling the chipper knives to ensure a flat mounting surface.
20. Using the 1/2" thick wood board for support, install the new chipper knives with the two flat head cap screws removed earlier, and tighten securely. Make sure the sharp edge is facing down, and the beveled edge is facing the rotor plate.
21. Reassemble the unit in the reverse sequence used to disassemble it in the preceding steps. Replace any hardware that is worn or damaged.
22. Test your unit for proper operation before attempting to use it to perform chipping.
23. Start the unit, and check for unusual noise or vibration.
    - Shut the unit off immediately if either situation occurs, and re-inspect chipping knives to confirm correct positioning and assembly has been done.
    - If assembly is correct, blades may not have been sharpened evenly, causing an imbalance. Remove blades and sharpen evenly.
    - Recheck unit. If problem persists, contact your local dealer for assistance.

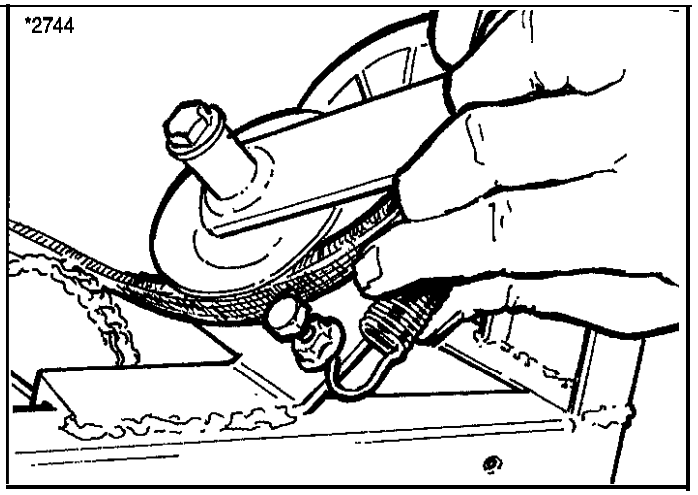


Figure 40. Lift Off Idler Pulley Spring

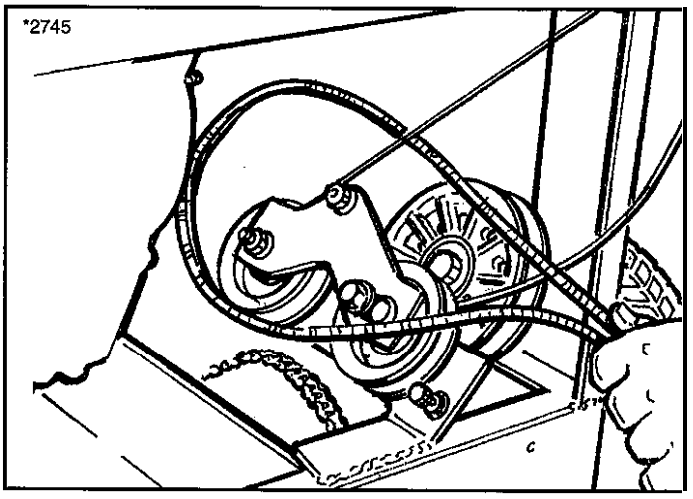


Figure 41. Insert Loop Over Idler Pulley Assembly

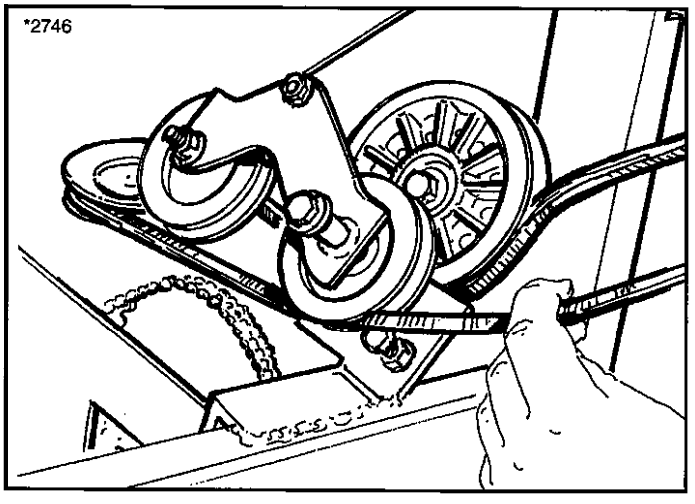


Figure 42. Wrap Belt Around Transmission Pulley

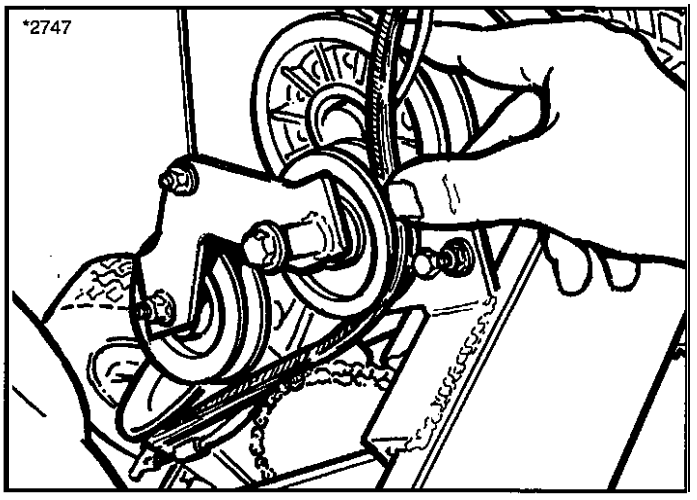


Figure 43. Wrap Drive Belt Around Lower Idler Pulley And Angled Pulley

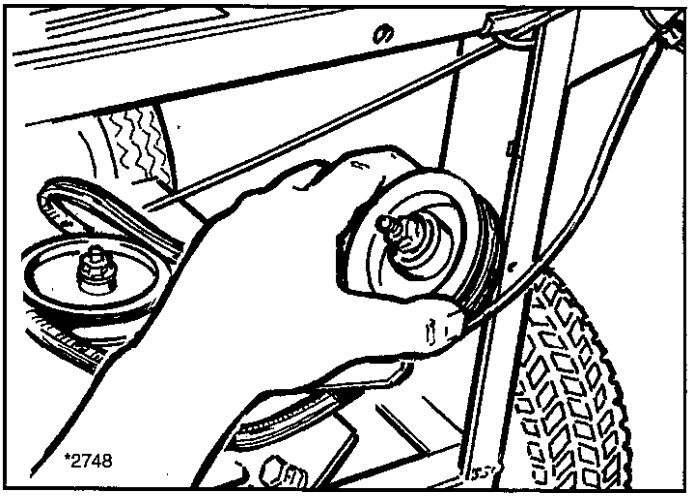


Figure 44. Pull Idler Pulley Assembly Back And Wrap Drive Belt Around Upper Idler Pulley

DRIVE BELT

1. The drive belt may be accessed by removing the top, right, and rear covers as shown in previous sections.
2. Remove the drive pulley bearing plate and slip off the drive belt as shown in Figures 19 - 21.
3. Lift the idler pulley spring off the threaded stud, and release tension on the idler pulley assembly. Note the path of the belt, then remove it through the back of the unit (Figure 40).
4. Inspect the belt for excessive wear, and replace if worn out or cracked. Make a loop with the new belt, and insert it into the rear of the unit, over the pivoting idler pulley assembly and toward the horizontal transmission pulley (Figure 41).
5. Wrap the belt around the transmission pulley, beveled edge in, and engage the lower idler pulley and bottom of the large angled pulley (Figure 42).
6. While maintaining light tension on the belt with one hand, wrap the drive belt around the lower idler pulley and angled pulley, and hold in place with the other hand (Figure 43).
7. Pull the pivoting idler pulley assembly back up into normal position, wrapping the drive belt around the upper idler pulley. At this point, the slack loop at the other end of the belt should be toward the drive belt pulley plate mounting area (Figure 44).
8. Pull the slack end of the drive belt toward the front of the unit, and loop it over the drive pulley drive shaft as you place the drive pulley drive shaft into the vacuum nozzle housing shaft opening (Figure 45).

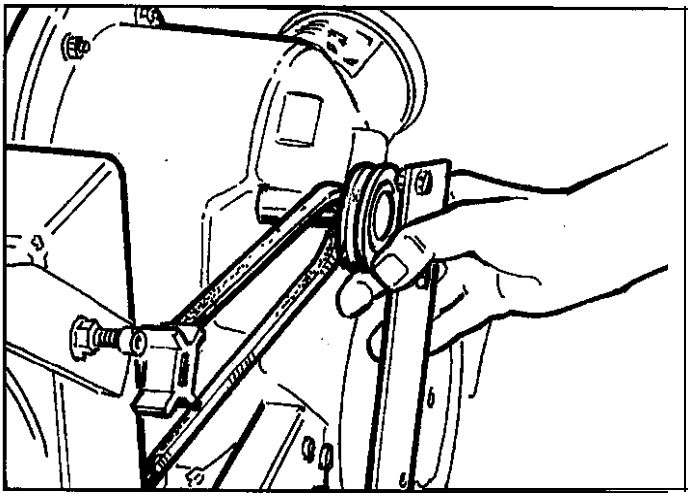


Figure 45. Loop Slack End Of Drive Belt Over Drive Shaft And On To Drive Pulley

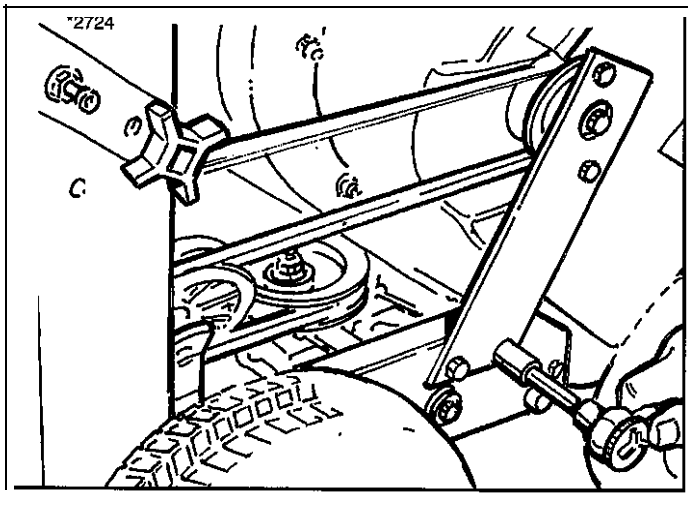


Figure 46. Install Drive Pulley Plate

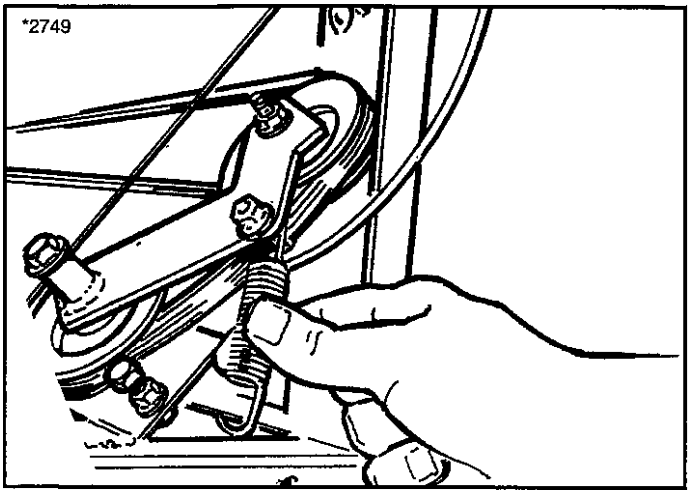


Figure 47. Reconnect Idler Pulley Tension Spring

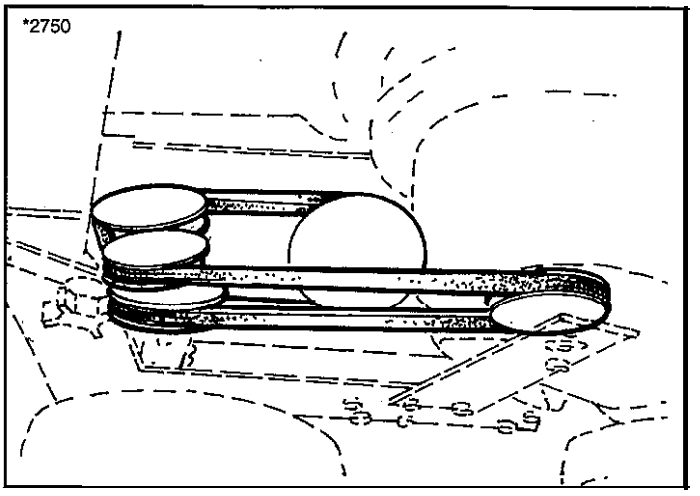


Figure 48. Drive Belt Installed Position On Pulleys

9. Lift the drive belt over the edge of the drive pulley and engage the pulley, beveled edge in, and slide the drive belt pulley plate and drive shaft into position. Install the two hex head screws and lock washers removed earlier, and tighten securely (Figure 46).

10. Reach around to the back of the unit, and making sure the drive belt is fully engaged in all pulleys, reconnect the tension spring to the threaded stud to maintain tension on the drive belt (Figure 47).

NOTE: The beveled edge of the drive belt should be engaged against the transmission pulley and the two pivoting idler pulleys, and the flat side of the drive be/t should be engaged against the larger, angled pulley with the wider groove (Figure 48).

11. Reassemble covers to unit in reverse sequence of disassembly.

DRIVE CHAINS

General

The drive chains may be accessed by tilting the back of the unit up, and supporting it securely to prevent the unit from falling backward during service. Drive chain access is from under the unit, and extreme care must be used when checking, tightening, or replacing drive chains. Do not tip the unit for service if the fuel tank is full. Drain the fuel tank carefully, and follow all precautions for handling gasoline when performing this step.

Drive chain tension may be adjusted by moving adjustable sprocket mounting brackets (front chain) or the drive axle (rear chain) to achieve desired tightness. Chains will have 1/8" (front) - 1/4" (rear) of flex between sprockets when properly tensioned.

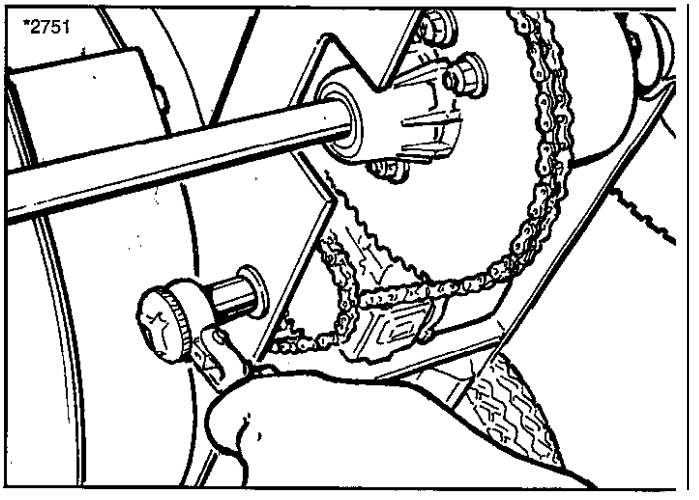


Figure 49. Loosen Hex Nut To Adjust Tension On Front Chain

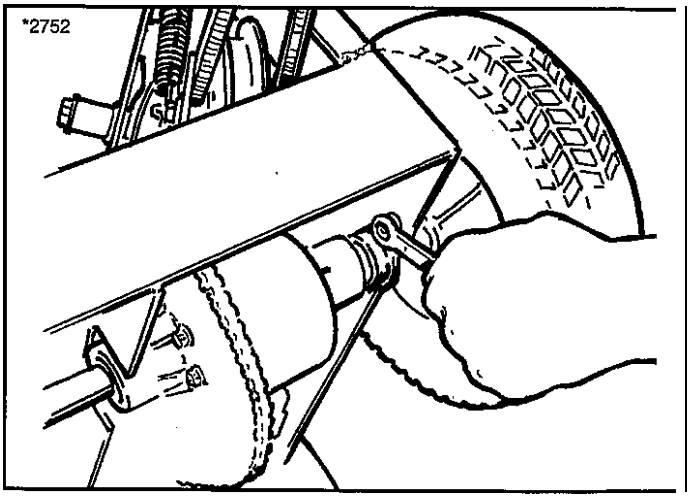


Figure 50. Loosen Hex Nut To Adjust Tension On Right Axle Mounting Bracket

Damaged chains may be replaced by first loosening tension, then disconnecting master link (front chain only) or removing complete chain (rear chain only), and installing new chain on sprockets.

Front Drive Chain

1. Loosen hex nut that locks sprocket in position, and move sprocket forward or backward until chain flexes approximately 1/8" when pressed midway between sprockets. Tighten hex nut securely when proper tension is reached on chain (Figure 49).
2. To replace chain, loosen hex nut to reduce tension, and separate chain links at master link. Install new chain over sprockets, and attach end with new master link. Readjust sprocket for proper tension, and tighten securely.

Rear Drive Chain

1. Rear drive chain tension adjustment requires the drive axle to be moved forward or backward.
2. Loosen axle mounting hardware at both frame mounting locations to permit movement of drive axle (Figures 50 & 51).
3. Move axle forward or backward to achieve desired tension, making sure rear sprocket is in line with drive sprocket.
4. When properly tensioned, rear drive chain should flex approximately 1/4" when pressed midway between sprockets.
5. Tighten adjustable axle mounts when proper tension is reached on the drive chain, and recheck sprockets for alignment. Readjust axle position if necessary to ensure alignment of sprockets.

VACUUM NOZZLE HEIGHT ADJUSTMENT

When properly adjusted, there should be approximately 1/8" of clearance between the bottom of the vacuum nozzle and a flat ground surface with the Vacuum Height Adjustment lever in the "Low" position. Adjust as follows:

1. Set the vacuum nozzle height adjustment lever to "LOW".
2. See figure 52. Have someone tilt the unit all the way back until you can see the adjustment rod and clip. Remove the clip from the height adjustment rod and pull the rod free of the front axle.
3. Turn the rod counterclockwise to lengthen the rod (Figure 53). Lengthening the rod will reduce the clearance between the nozzle and the ground; shortening the rod will increase the amount of clearance between the nozzle and the ground.

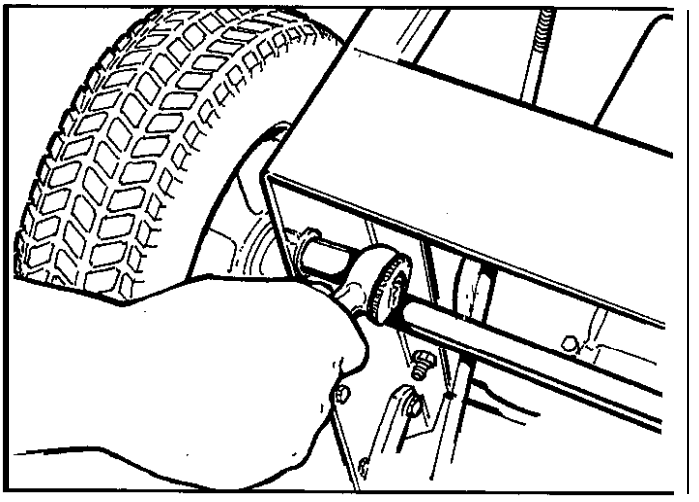


Figure 51. Loosen Hex Nut To Adjust Tension On Left Axle Mounting Bracket

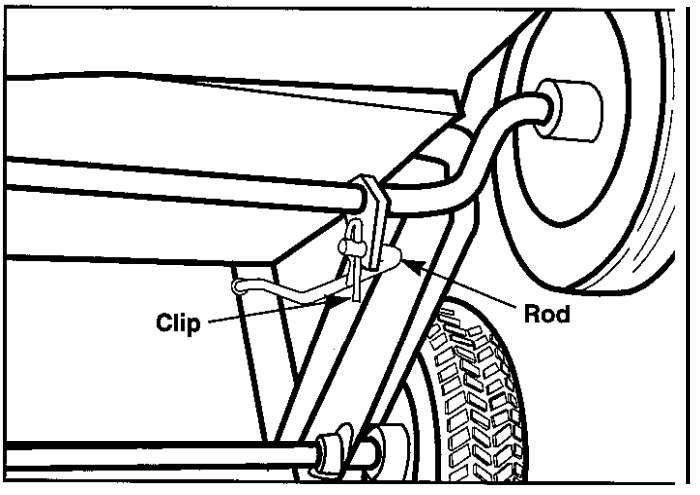


Figure 52. Disconnect Adjustment Rod

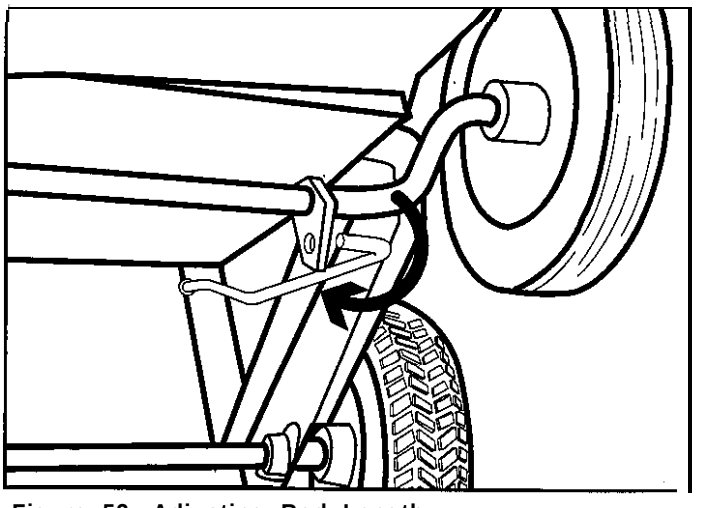


Figure 53. Adjusting Rod Length

4. See figure 52. Reattach the rod to the front axle with the clip.

NOTE: Changing the rod length will affect the ground clearance measurement at all height ranges and may be used to make fine adjustments to the nozzle height at any position desired.

CLUTCH CABLE

The clutch cable does not require service. If the clutch cable should become detached from the clutch lever, follow these steps:

1. Remove the vacuum nozzle housing as illustrated in the hammer service section of this manual.
2. The clutch lever is located directly in front of the transmission.
3. To reattach the clutch cable to the clutch lever, push the clutch lever back with one hand, and insert the cable end into the hole in the lever (Figure 54).
4. When properly inserted, the clutch cable end hook will be seated at the second bend in the hook (Figure 55).
5. With the unit turned off, check the clutch lever for proper operation by operating the power drive bail lever. Make sure that there is no slack in the clutch cable when the bail lever is fully depressed against the handle of the unit. If the cable is slack, release the bail lever and move the spring end down one link on the chain connector, and recheck for tautness. Adjust tension until clutch cable is taut when bail lever is depressed (Figure 56).
6. Reassemble the unit in the reverse sequence used for disassembly.

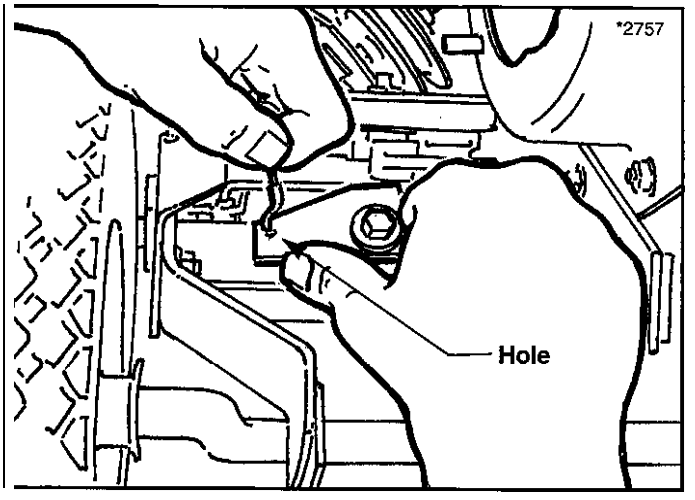


Figure 54. Push Clutch Lever And Reinsert Cable End

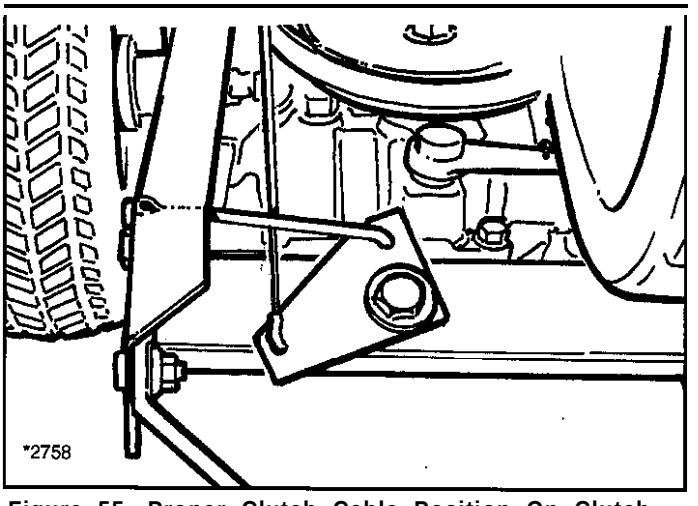


Figure 55. Proper Clutch Cable Position On Clutch Lever

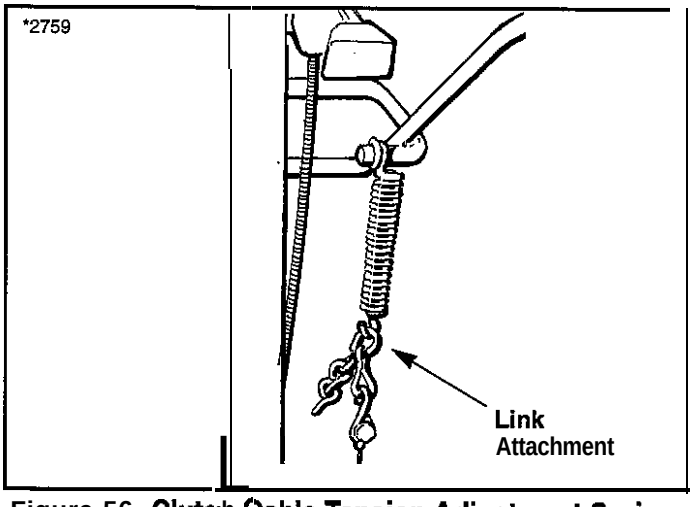


Figure 56. Clutch Cable Tension Adjustment Spring

Options & Accessories

VACUUM ATTACHMENT

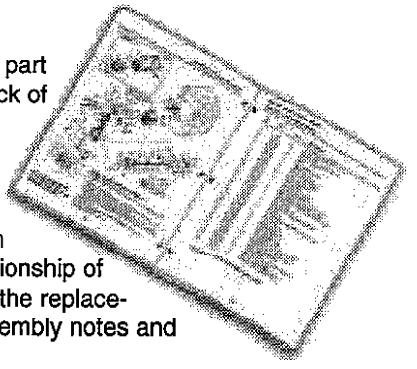
This easy-to-add accessory allows the Chipper Vacuum to be equipped with a vacuum hose and other attachments to help simplify pick up of lightweight materials such as leaves and grass clippings. It can also be adjusted to vacuum without disturbing landscaping material such as decorative rock.

Technical Manuals

Additional Technical Literature Available

Operators Manuals

Additional copies of this manual are available, (and as part of our product support commitment, we maintain a stock of printed operators manuals going back many years!)



Parts Manuals

Fully illustrated pans manuals are also available — these manuals show all of the product's components in exploded views ("3D" illustrations which show the relationship of the parts and how they go together), as well as giving the replacement part numbers and quantities used. Important assembly notes and special torque values are included in these manuals.

For the applicable manuals currently available for your model, contact our Customer Publications Department at 414-284-8519. Have the information listed in the box at the right available when phoning in your request.

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